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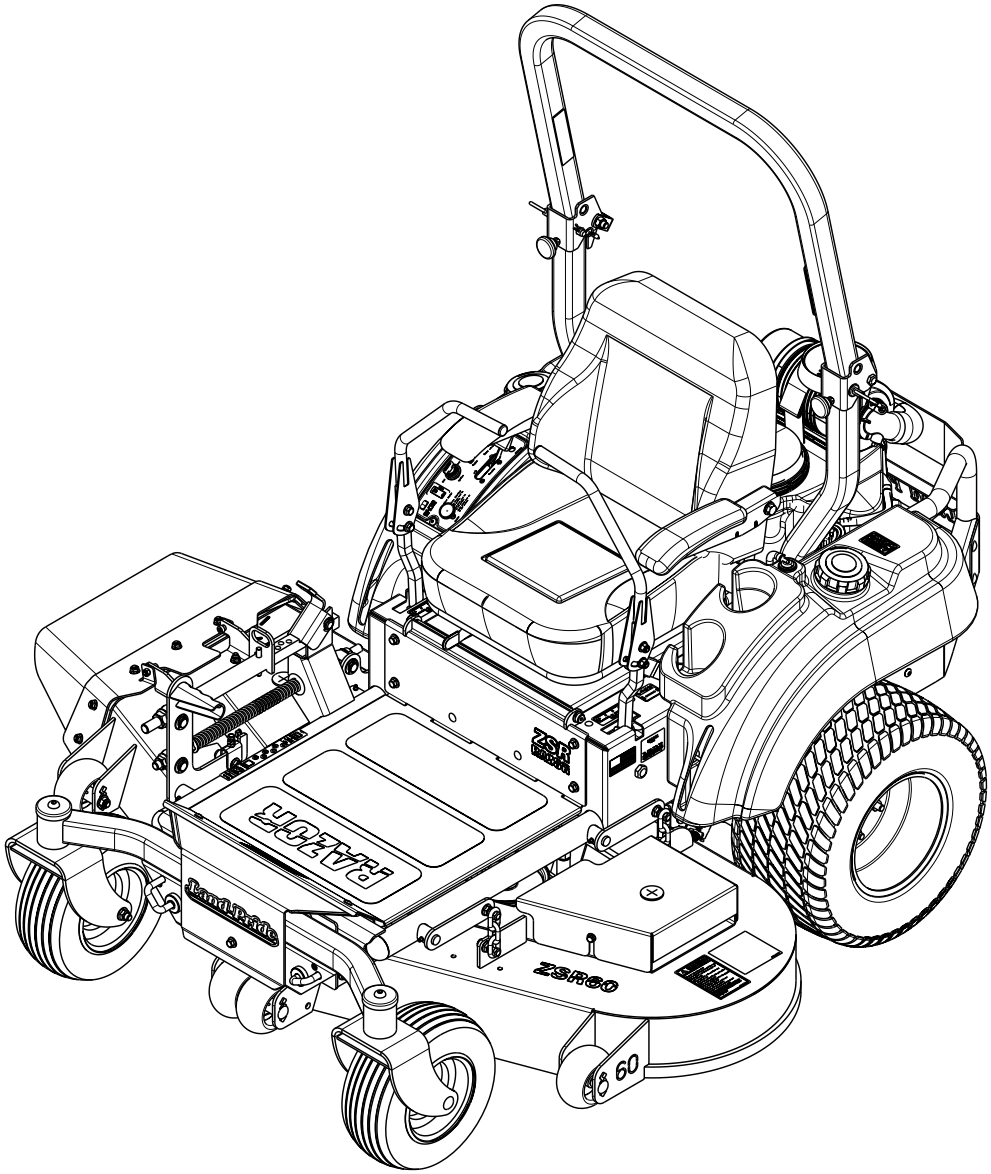
Zero Turn Mowers

ZSR54 & ZSR60

Accu-Z Razor®



27800

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Service Manual

Land Pride

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Steering Arm Removal

Refer to Figure 1-1:

1. Loosen and remove two steering arm retaining bolts.
2. Slide steering arm up and off of the drive control stub.
3. Repeat steps 1 through 2 for other side.

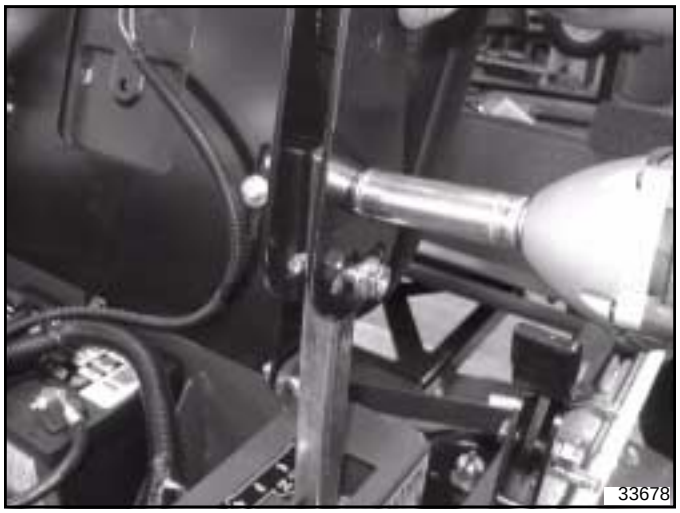


Figure 1-1

Steering Arm Installation

Refer to Figure 1-2:

1. Slide steering arm to desired height and install pivot bolt and nut.

NOTE: Do not tighten at this time.

2. Install bolt and nut in arm adjustment slot.
3. Adjust arms to desired angle for operation.

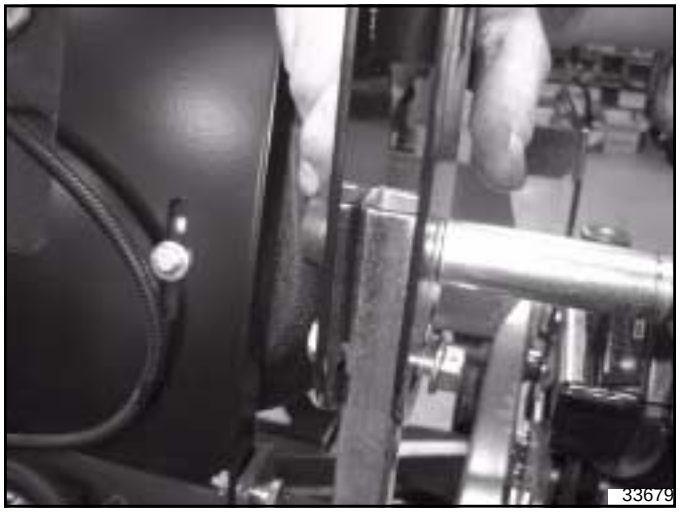


Figure 1-2

Refer to Figure 1-3:

4. Tighten all fasteners to standard torque. See chart on page 79.
5. Repeat steps 1 through 4 for other side.

Figure 1-3

Control Arm and Lever Removal

Refer to Figure 1-4:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. Disconnect and remove seat pan assembly for easy access.
4. Remove steering arm. See **"Steering Arm Removal"** on page 4.
5. Unlock and remove retaining cap on the base end of the control damper and remove from frame stud.

Figure 1-4

Refer to Figure 1-5:

6. Loosen and remove nut on the drive control rod assembly and remove from steering lever.
7. Loosen and remove the steering lever retaining nut and washer.
8. Remove steering lever bracket from frame mount bolt. Ensure that the control arm is out in the brake position and allow it to slide though the frame.

Figure 1-5

Refer to Figure 1-6:

9. Unlock and remove retaining cap on the rod end of the control damper and remove from the steering lever stud.
10. Loosen and remove spring retaining nut and washer from the control arm mount bolt.
11. Remove damper stud, pivot bushings, control arm tension spring, and control arm from the steering lever.
12. Repeat steps 4 through 11 for other side.

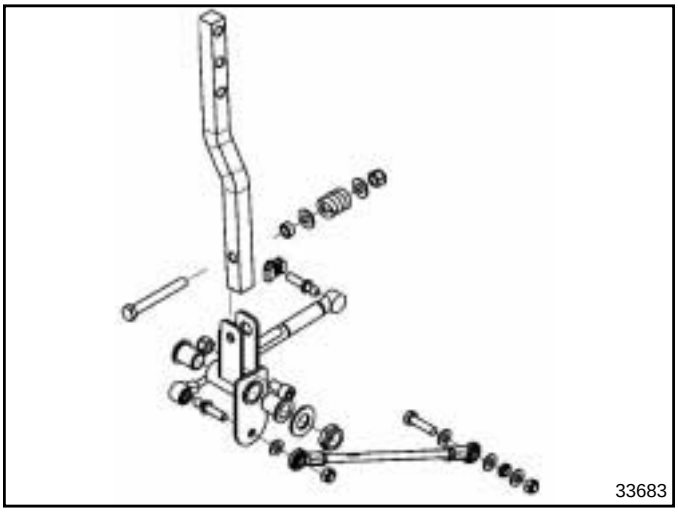


Figure 1-6

Control Arm and Lever Installation

Refer to Figure 1-7:

1. Install flanged wear pivot bushings in both sides of the control arm.

Figure 1-7

Refer to Figure 1-8:

2. Align and install the steering lever on the control arm bolt.
3. Install the pivot washer, compression spring, retaining washer and retaining lock nut.
4. Tighten compression spring lock nut until threads are showing, may be adjusted to desired tension after installation onto frame.
5. Install the damper stud into the rod end of the damper and secure with retaining cap.
6. Insert threaded end of damper stud into the control arm. The control rod retaining nut may be loosely installed to aid in assembly.

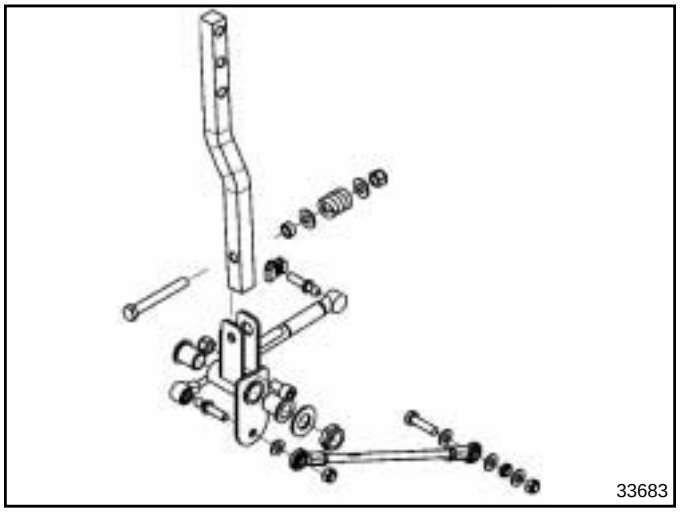


Figure 1-8

NOTE: Ensure correct alignment for left or right hand side when inserting damper stud so that the damper will be between frame and control arm.

Refer to Figure 1-9:

7. Push the control lever out into the brake position and insert though frame.
8. Align and install the control arm on the frame mounting bolt, secure with retaining washer and lock nut.
9. Tighten the steering arm retaining lock nut until tight, then back off 1/8th of a turn to allow for free movement of the steering arm.
10. Align and install the drive control rod assembly on the threaded end of the control arm damper stud, and secure with retaining lock nut.
11. Align and install base end of damper on frame stud and secure with locking cap.
12. Install steering arm. See **"Steering Arm Installation"** on page 4.
13. Repeat steps 1 though 12 for other side.

Figure 1-9

Park Brake Removal

Refer to Figure 1-10:

1. Chock front wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. Raise and secure rear of mower and remove rear wheels for easy access. See **"Rear Drive Wheel Removal"** on page 35.
4. With park brake disengaged loosen and remove the park brake handle retaining flanged lock nut.

Figure 1-10

Refer to Figure 1-11:

5. Remove the carter pin and retaining washer from the upper end of the brake link spring assemblies.
6. Disconnect the brake link spring assemblies from the park lever pivot assembly.
7. Pull the hair pin clip and retaining washer from the lower end of the brake link spring assemblies.
8. Disconnect the brake link spring assemblies from the trans-axle brake control levers.

Figure 1-11

Refer to Figure 1-12:

9. Remove the park lever pivot assembly by pushing the assembly to the left and compressing the compression spring. Pull the right side of the pivot assembly from the pivot bushing on the right hand side and pull it up and out of the unit.

Figure 1-12

Park Brake Installation

Refer to Figure 1-13:

1. Align and insert the park lever pivot bushings in the unit frame.
2. Install compression spring on the brake handle lug end of the park lever pivot assembly.
3. Align and install the park lever pivot assembly into the frame by starting with the left hand side and compressing the spring. Install the right hand side of the park lever pivot assembly into the frame and allow the spring to push into place.

Figure 1-13

Refer to Figure 1-14:

4. Assemble the brake link spring assemblies by inserting a brake link into each end of the spring.
5. Align and install the brake link spring assemblies down to the trans-axle brake lever and attach to the park lever pivot assembly.
6. Secure both brake link spring assemblies to the park lever pivot assembly with retaining washers and carter pins.

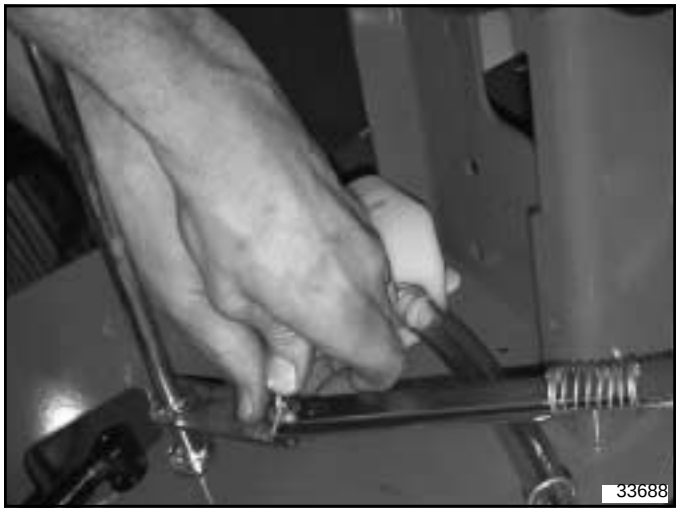


Figure 1-14

Refer to Figure 1-15:

7. Attach the bottom of the brake link spring assemblies to the trans-axle brake control levers.
8. Secure both brake link spring assemblies to the trans-axle brake control levers with retaining washers and hair pin clips.
9. Align and install the park brake handle though the frame and secure with carriage bolt and flanged lock nut.

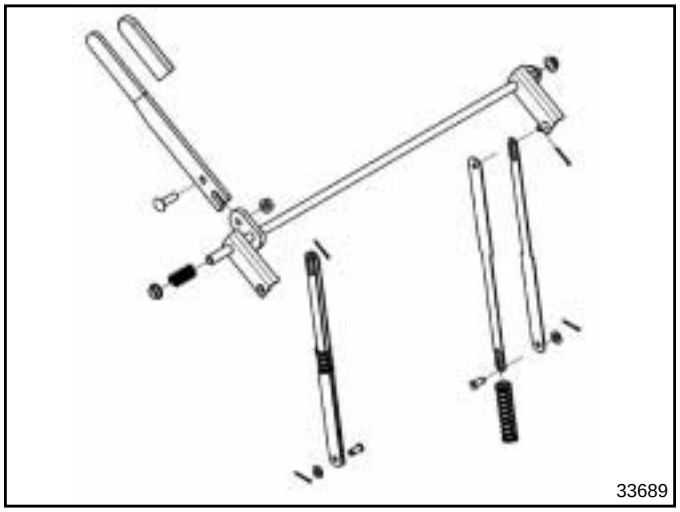


Figure 1-15

Deck Lift Removal

Refer to Figure 1-16:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Remove the deck height stop from the height gauge bar.
3. Place blocks under the mower deck and lower the deck until the deck is fully supported by the blocks.

Figure 1-16

Refer to Figure 1-17:

NOTE: Ensure that the deck chains are all slack.

4. Remove the E-clip from the height gauge bar trunnion that attaches the height gauge bar to the foot lift peddle and remove the height gauge bar trunnion from the foot lift peddle.
5. Slide the height gauge bar out of the frame channel. The height pawl will not need to be removed for removal of the height gauge bar.
6. Disconnect and remove the deck lift assist spring from the deck lift pivot.

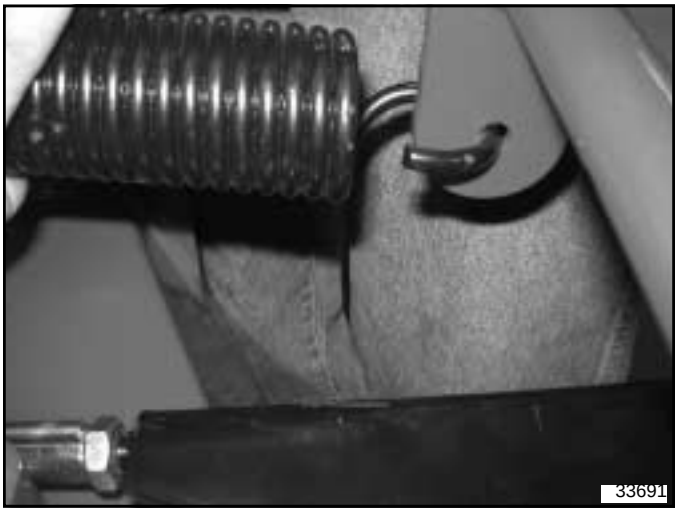


Figure 1-17

Refer to Figure 1-18:

7. Remove the E-clips from both the front and rear of the lift spring assembly trunnions.

NOTE: Springs are under compression against the frame stop and front jam nut on the lift spring assembly and care should be taken when removing.

8. Remove lift spring trunnion from the front deck lift arm and loosen the nuts and move the trunnion to the end of the spring rod.
9. Compress the spring assembly back to loosen and remove the lift spring trunnion from the back deck lift arm.
10. Allow spring on the lift spring assembly to uncompress and remove the lift spring assembly through the slot in the frame stop

Figure 1-18

Deck Lift Installation

Refer to Figure 1-19:

1. Raise and block deck up to allow chains to be loose during the installation of the lift spring assemblies.
2. Install jam nut with flange out on the threaded end of the lift spring rod, allow enough room to install and tighten the rear lift spring trunnion. Tighten jam nut against the rear lift spring trunnion and tighten.
3. Install the spring stop washer and spring on to the spring rod.
4. Install the spring compression flanged nut, jam nuts, and the front lift spring trunnion loosely on the spring rod.

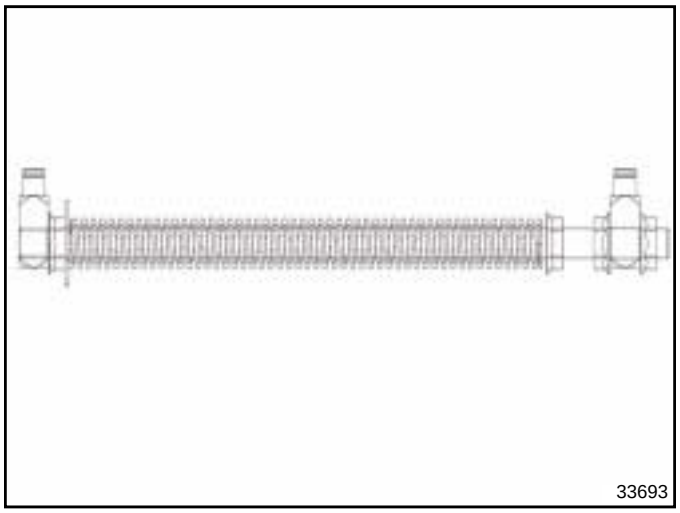


Figure 1-19

Refer to Figure 1-20:

5. Align the lift spring assembly with the spring stop washer to the front of frame stop and insert the rod, compressing the spring assembly to install the rear lift spring trunnion in the rear deck lift arm. Secure rear lift spring trunnion to the rear deck lift arm with E-clip.
6. Tighten the lift spring compression nut and install the front lift spring trunnion in the front deck lift arm. Secure the front lift spring trunnion to the front deck lift arm with E-clip.
7. Tighten jam nuts against the front lift spring trunnion. The lift spring compression nut will be adjusted per **“Deck Lift Assist Springs”** on page 51.
8. Align and install deck lift assist spring eye bolt in frame and connect the spring to the deck lift pivot.

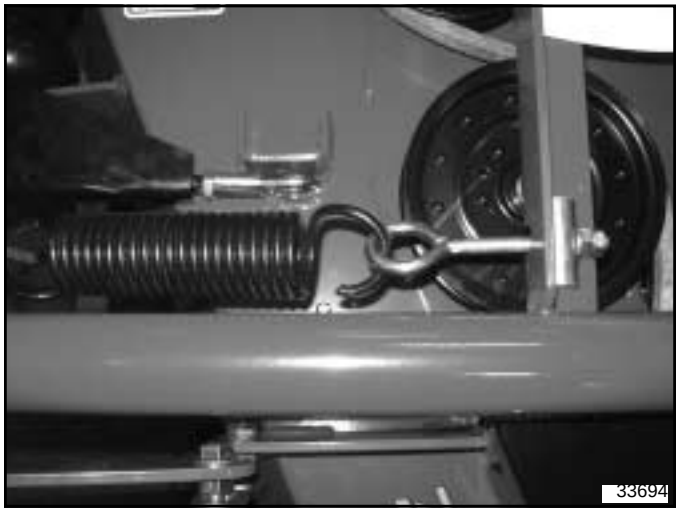


Figure 1-20

Refer to Figure 1-21:

9. Install jam nuts and the height gauge bar trunnion loosely on the end of the height gauge bar.
10. Install the height gauge bar in the frame channel and install the height gauge bar trunnion in the foot lift peddle and secure with E-clip.
11. Attach the height pawl to the frame channel with the height pawl pivot pin and secure with E-clips.
12. Install the deck height stop and follow the adjustment for **“Deck Cutting Height And Leveling”** on page 50.

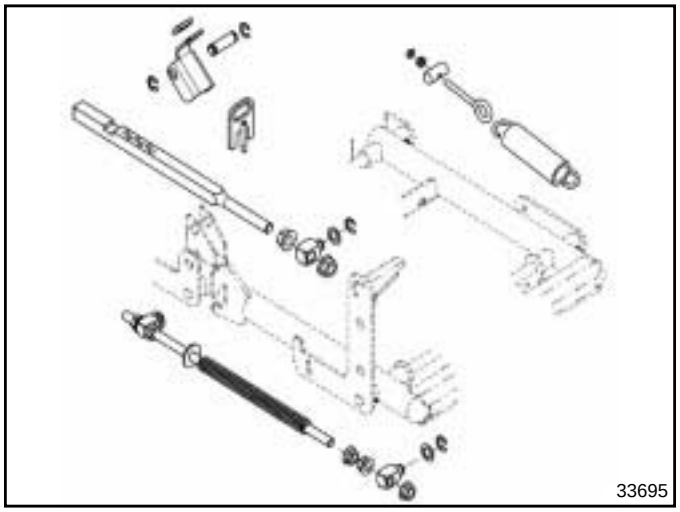


Figure 1-21

Control Panel Removal

Refer to Figure 1-22:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. Disconnect and remove seat for easy access.
4. Cut and remove plastic zip ties securing the throttle and choke cables to the frame.

Figure 1-22

Refer to Figure 1-23:

5. Loosen engine clamps on both the throttle and choke cables. Mark each cable for reference.
6. Disconnect the throttle and choke cables from the engine.

NOTE: Picture is for reference only, cable attachments will vary with engine model and type.

Figure 1-23

Refer to Figure 1-24:

7. Loosen and remove the cross head bolts on the control panel.
8. Lift the control panel out of the fuel tank and disconnect all electrical connections.
9. While removing the control panel, insure that the throttle and choke cable do not become bound and pull free of the opening in the bottom of the fuel tank.

Figure 1-24

Control Panel Installation

Refer to Figure 1-25:

1. Start by routing the throttle and choke cable though the top of the fuel tank and out the opening in the bottom of the cavity in the fuel tank.

NOTE: Mark the ends of each cable to identify when connecting to the engine.

2. Route the throttle cable and choke cable along the frame and between the bumper and engine, do not connect to the engine at this time.

Figure 1-25

Refer to Figure 1-26:

3. Connect the electrical connectors to the control panel. See the **"Main Harness Wiring Schematics"** on page 25 of the manual for more information on correct connections.

NOTE: Ensure that all connectors are spaced and firmly connected.

4. Secure control panel to the fuel tank with cross head bolts. Tighten bolts until snug against the control panel.

Figure 1-26

Refer to Figure 1-27:

5. Connect the throttle and choke cable to engine as per engine specifications, see engine manual for more information on correct engine set up.
6. Attach the throttle and choke cable to the engine clamps allowing for enough slack to adjust correctly.
7. Secure the throttle and choke cables to the frame with plastic zip ties to prevent the cables from binding or rubbing.
8. Test cable operation for binding or dragging of cables.

Figure 1-27

Seat and Latch Removal

Refer to Figure 2-1:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. Unlatch seat pan and pull the seat assembly into the upright forward position.
4. Disconnect the operator presence switch from the wiring harness at the switch.

Figure 2-1

Refer to Figure 2-2:

5. Loosen and remove the seat pan retainer nuts on the left and right side of the seat pan assembly.
6. Support the seat pan assembly and remove both retaining hex socket bolts, remove assembly.
7. Loosen and remove four seat retaining bolts and remove pan from seat.

Figure 2-2

Refer to Figure 2-3:

8. With a long socket inserted in spring assembly, loosen and remove the seat spring retaining nut to remove spring.
9. Loosen and remove the latch retaining nut.
10. Holding latch return spring, remove the latch lever from the mounting bolt.

Figure 2-3

Seat and Latch Installation

Refer to Figure 2-4:

1. Align and install seat pan on seat with four bolts, lock washers and flat washers.
2. Center seat bolts on the seat pan slot to the middle and tighten bolts.

Figure 2-4

Refer to Figure 2-5:

3. Align and install seat pan pivot bushings in frame from the inside out.
4. Align and install seat pan assembly on unit with hex socket bolts, raise and secure with flange nuts.

Figure 2-5

Refer to Figure 2-6:

5. Insert washer and spring retaining bolt into the open end of the seat springs.
6. Align and install the seat spring into frame and secure with flanged lock nut.
7. Install the wavy spring washer on the seat latch frame mount bolt.
8. Install the latch return spring onto the latch.
9. Align and install the latch on the seat latch frame bolt while compressing the return spring.
10. Secure latch with the flanged lock nut, back nut off 1/8th of a turn.

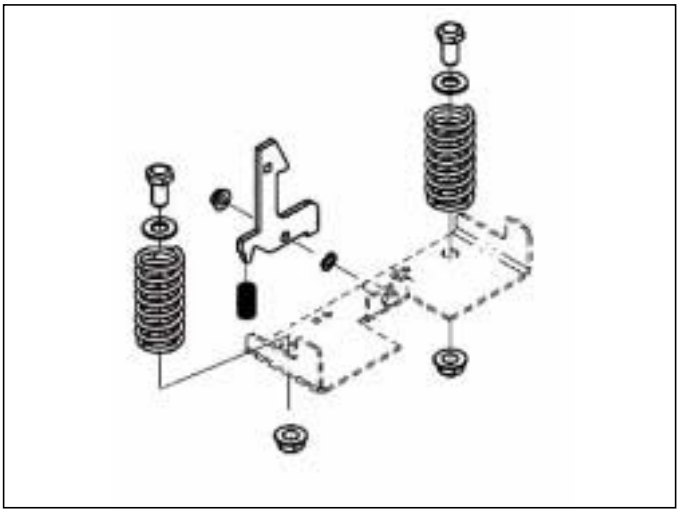


Figure 2-6

Floor Panel Removal

Refer to Figure 2-7:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Loosen and remove floor panel retaining bolts.

Figure 2-7

Refer to Figure 2-8:

3. Pull forward on the front section of the floor panel to disengage the slotted rear section of floor panel mounting area.

Figure 2-8

Floor Panel Installation

Refer to Figure 2-9:

1. Align and install the slotted rear section of the floor panel with the mower frame.
2. Align and install floor panel retaining bolts.

Figure 2-9

Engine Bumper Guard Removal

Refer to Figure 2-10:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.

NOTE: Ensure that mower is cooled before performing any repair around the engine and muffler to prevent accidental burning.

3. Cut and remove all plastic zip ties securing cables and wires to the engine bumper guard.
4. Loosen and remove the locknuts from the Alan head bolts on the lower bumper frame and remove bolts.

Figure 2-10

Refer to Figure 2-11:

5. Loosen and remove the locknuts on the engine bumper guard bolts secured to the pedestal. Do not remove bolts until the engine bumper guard is removed from the unit.
6. With the lower engine bumper guard bolts removed and the nuts removed from the bolts on the pedestal, lift the engine bumper guard up at the front to remove bolts and back to clear the engine muffler.

Figure 2-11

Engine Bumper Guard Installation

Refer to Figure 2-11:.

NOTE: Never operate unit with out the rear engine bumper guard installed to prevent accidental injury or damage to the mower.

1. Assemble the engine bumper guard and tighten all fasteners to standard torque. See **"Torque Values Chart"** on page 79.
2. Align engine bumper guard over the muffler and attach the front of the guard to the pedestal base with retaining bolts and lock nuts. Do not tighten until all bolts have been installed.

Refer to Figure 2-12:

3. Insure all cables and wires are aligned inside of the engine bumper guard and not pinched in between the assembly and the frame.
4. Align and install the lower engine bumper guard bolts though the assembly and into the frame. Secure with the flanged locknuts.
5. Tighten all the lower engine bumper guard bolts and the two pedestal retaining bolts until the flanged lock nuts are firmly secured to the main frame.
6. With plastic zip ties secure all loose cables and wires to the engine bumper guard assembly.

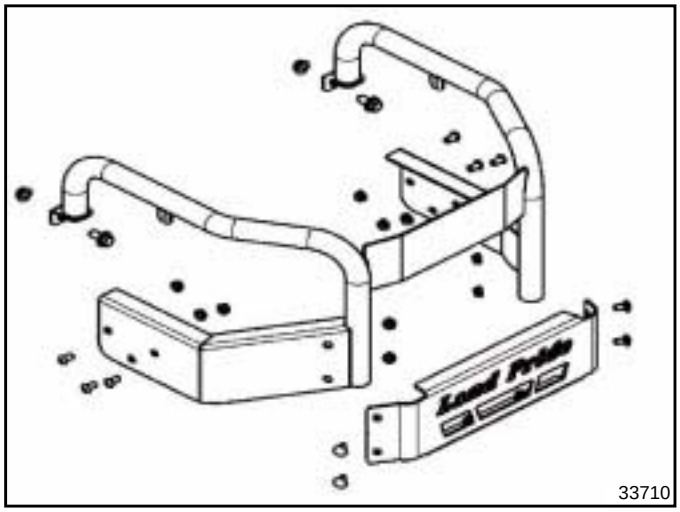


Figure 2-12

Deck Removal

Refer to Figure 3-1:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Remove the deck height stop from the height gauge bar.
3. Place blocks or pallet skid under the mower deck and lower the deck until the deck is fully supported and the deck chains are slack.
4. Raise floor panel to access the over center latch. Loosen deck belt tension by pulling the securing pin on the over center latch assembly and rotate counter clockwise to disengage the latch. Remove belt from the clutch.

Figure 3-1

Refer to Figure 3-2:

5. Remove the seat pan assembly from the mower for ease of access. See **"Seat and Latch Removal"** on page 13.
6. Loosen the nuts on the bolts for the deck interface gimbals and remove the bolts from the deck strut bracket.
7. The deck interface arms may be removed or secured to prevent them from falling onto the deck during removal of the deck.

Figure 3-2

Refer to Figure 3-3:

8. Loosen and remove the flanged nuts securing the deck lift chains to the deck lift arms. Remove the bolts from the deck lift chains and allow the chains to drop down onto the mower deck.

NOTE: Lift chains do not need to be removed from the deck for these repairs.

9. Remove the deck assembly from under the mower by pulling it out from the side.

Figure 3-3

Deck installation

Refer to Figure 3-4:

1. Slide the deck assembly under the mower and align the deck so that the lift chains are under each of the deck lift arms.
2. Raise the deck approximately 3 to 4 inches to allow slack in the deck lift chains when installing.
3. Install the deck lift arm chain bolts on the deck chains and secure with the inner flange nuts.

> **NOTE:** Do not over tighten the chain on the bolt. The chain should pivot easily on the bolt.

4. Attach the deck lift chains to the deck lift arms and secure with the flanged nuts.

Figure 3-4

Refer to Figure 3-5:

5. If the deck interface arms were removed during deck removal, align and reinstall the deck interface arms to the frame with pivot bolts and flanged lock nuts. Do not tighten until the deck interface gimbals have been secured to the deck strut bracket.
6. Align the deck interface arm gimbals to the inside of the deck strut bracket. Secure with bolts and locknuts through the interface gimbals. Tighten strut pivot bolt lock nuts.

Figure 3-5

Refer to Figure 3-6:

7. Install belt on the clutch insuring correct belt routing as per the **"Deck Drive Belt Removal & Installation"** on page 64.
8. Tighten belt by rotating the over center latch assembly clockwise until the latch assembly engages. Secure the over center latch with the latch pin.
9. Remove blocks and adjust deck as per the **"Deck Adjustments"** on page 50.

Figure 3-6

Pulley and Blade Hub Removal

Refer to Figure 3-7:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Remove the floor panel to access the over center latch. See **"Floor Panel Removal"** on page 15.
3. Loosen deck belt tension by pulling the securing pin on the over center latch assembly and rotate counter clockwise to disengage the latch. Remove belt from the clutch.
4. Loosen and remove pulley retaining nut on spindle assembly to be removed and remove pulley.

Figure 3-7

Refer to Figure 3-8:

5. Loosen and remove blade bolt from spindle assembly to be removed and remove blade.
6. Loosen and remove the four spindle assembly retaining nuts on top of the deck for the spindle assembly to be removed. Pull the spindle assembly out though the bottom of the mower deck.

Figure 3-8

Pulley and Blade Hub Installation

Refer to Figure 3-9:

1. Insert spindle hub assembly though the bottom of the deck and attach with bolts, lock washers, and nuts. Tighten in a cross pattern until properly torqued.
2. Align and install the drive pulley onto the spindle with key and locknut. Tighten locknut to the correct torque.
3. Install blade washer and blade onto the spindle assembly and tighten bolt to approximately 45 ft/lbs.

NOTE: Do not over tighten blade bolt as this bolt will tighten during operation of the mower.

4. Ensure correct belt routing per **"Deck Drive Belt Removal & Installation"** on page 64.
5. Tighten belt by rotating the over center latch assembly clockwise until the latch assembly engages. Secure the over center latch with the latch pin.
6. Perform belt tension adjustments as per instructions on **"Deck Drive Belt Adjustment"** on page 49.

Figure 3-9

Spindle Hub Rebuild

Refer to Figure 3-10:

1. Secure spindle hub assembly in vice with the lower shaft and bearing clear of vise clamps.
2. With spindle pulley removed, loosen and remove the grease zerk from the spindle.
3. With a rubber mallet, tap the spindle shaft to drive the spindle shaft, lower bearing, and blade hub from the bottom of the spindle hub assembly.

Figure 3-10

Refer to Figure 3-11:

4. Loosen vice, turn the spindle hub assembly over and re-secure in vice.
5. With a bearing removal tool or pipe, drive the upper bearing out the top of the spindle hub.
6. Loosen vice and remove spindle hub.
7. Secure the spindle shaft with the lower bearing and blade hub attached in vice with the blade hub facing upright. Pad shaft in vice with shop rag to prevent scaring or damage to the spindle shaft.
8. Loosen and remove the blade hub from the spindle shaft. This is a right hand thread, 1-14 class 2B threaded shaft.
9. Remove the lower bearing from the spindle shaft. A bearing puller may be required for removal.
10. Clean and replace spindle hub assembly parts as needed.
11. Pre-grease or “pack” the bearing before assembly to ensure adequate lubrication and for ease of installation of the bearing into the spindle hub.
12. Secure the spindle shaft with the blade bolt facing upright in vice. Pad the vice with shop rag to prevent scaring or damage to the spindle shaft.
13. Install the bottom bearing onto the spindle shaft and with a bearing set tool or small pipe ensure that the bearing is fully seated against the spindle shaft lower bearing stop.

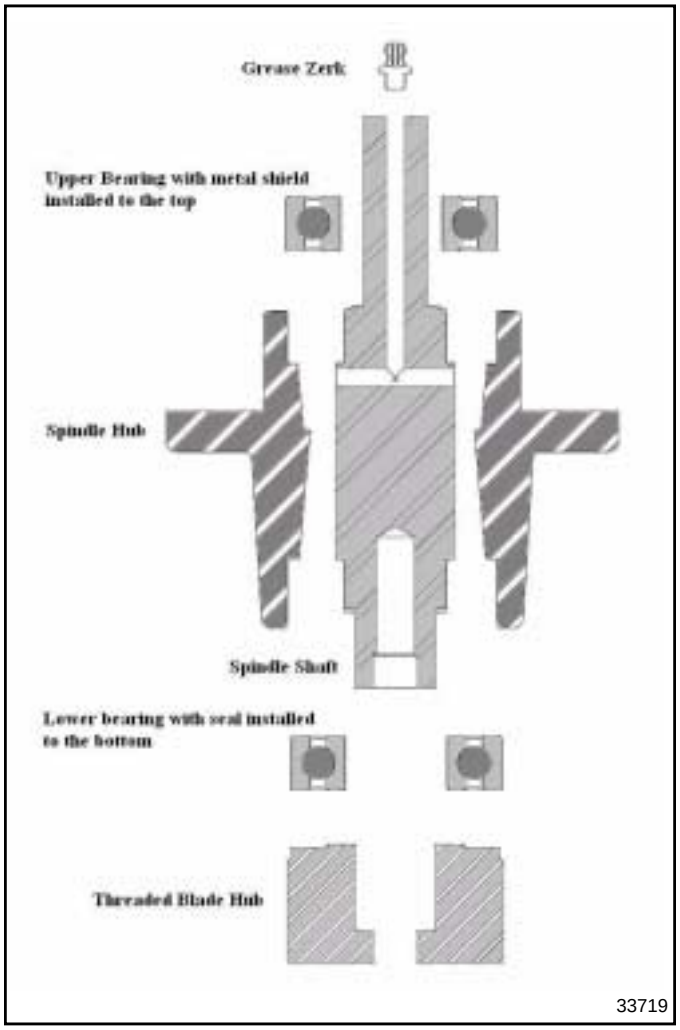


Figure 3-11

Refer to Figure 3-12:

14. Thread the blade hub onto the spindle shaft. Ensure that the stepped bearing surface is facing the lower bearing and tighten until firmly secured against the lower bearing.
15. Loosen and remove the spindle shaft from the vice and set aside on a clean surface for installation in spindle hub. Secure the spindle hub in vice with the top side up.
16. Apply a light coat of grease to the upper spindle shaft. Align and install the spindle shaft assembly though the bottom the spindle hub assembly. With a rubber mallet, tap the blade hub to fully seat the lower bearing into the spindle hub.
17. Loosen vice, turn the spindle hub assembly over and re-secure in vice with the blade hub down and against the vise clamps to prevent lower bearing from being driven out during installation of the top bearing.
18. With bearing set tool or pipe, install the top bearing over the spindle shaft. Ensure that the metal shield is installed out, away from the spindle hub assembly, and that the bearing is fully seated in the spindle hub.
19. Install grease zerk in the top of the spindle shaft and tighten hand tight. Attach grease gun and fill the spindle hub assembly until grease comes out the purge hole on the upper bearing.
20. Remove spindle hub assembly from vice. If the spindle hub is not going to be installed in mower, install the spindle pulley and key onto the spindle.

Figure 3-12

Battery Assembly Removal

Refer to Figure 4-1:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. For ease of access, remove the seat assembly. See **"Seat and Latch Removal"** on page 13.
3. Loosen and disconnect the system battery cables from the battery.

NOTE: Disconnect the ground cable before removing the positive cable.

4. Loosen and remove the lock nuts on the battery hold down bracket and remove the hold down bracket.

Figure 4-1

Refer to Figure 4-2:

5. Loosen and remove the jam nut from the battery hold down bracket bolts and remove the bolts from the battery tray. Remove the battery from the battery tray.
6. Loosen and remove the battery tray retaining bolts that connect the battery tray to unit frame.
7. Remove the battery tray from the unit frame.

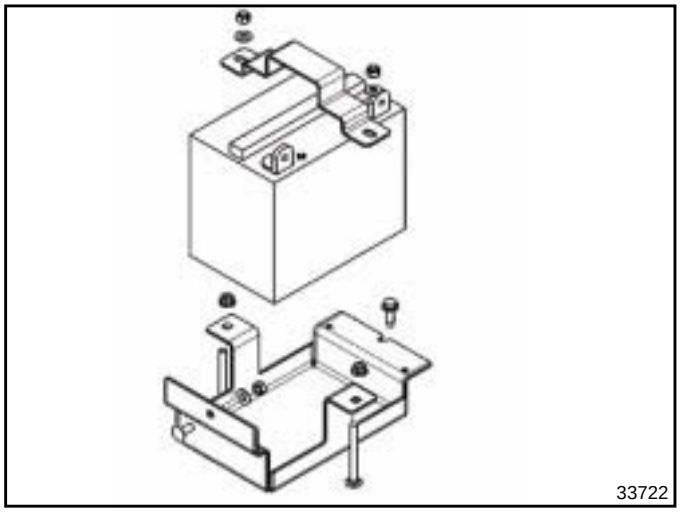


Figure 4-2

Battery Assembly Installation

Refer to Figure 4-3:

1. Align and install the battery tray in the unit frame.
2. Secure the battery tray with retaining bolts.
3. Install battery in the battery tray with terminals to the left hand side of the unit.
4. Install the battery hold down bolts in the battery tray and secure with flanged lock nuts.
5. Install the battery hold down strap over the battery and secure with flanged lock nuts.

NOTE: Always install the ground system cable after the positive system cable to prevent accidental shock or damage to the electronic components in the mowers electrical system.

6. Attach the positive system cable to the positive battery post.
7. 7. Attach the ground system cable to the negative battery post. Check all wire connections and test for system continuity.

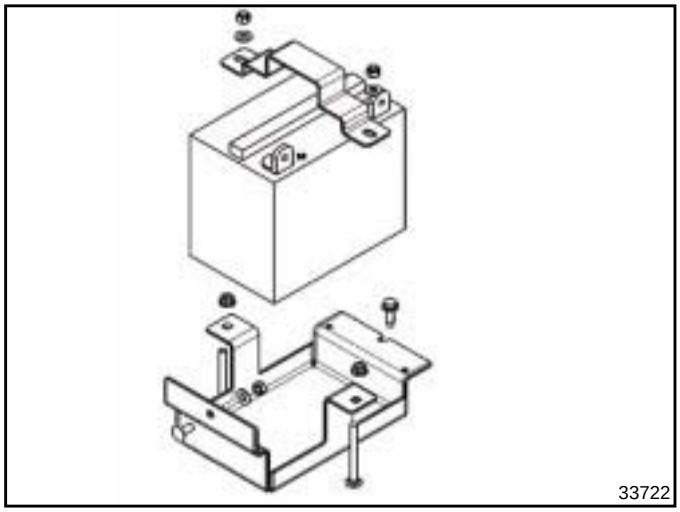


Figure 4-3

Wiring Harness Removal

Refer to Figure 4-4:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. For ease of access, remove the seat assembly. See **"Seat and Latch Removal"** on page 13.
4. Cut and remove all the plastic zip ties securing the wiring harness to the frame.

Figure 4-4

Refer to Figure 4-5:

5. Remove control panel and disconnect it from wiring harness. See "**"Control Panel Removal"** on page 11.
6. Disconnect the wiring harness from all brake, seat, and neutral interlock switches. See "**"Main Harness Wiring Schematics"** on page 25 for location of all connectors.
7. Disconnect the engine wiring harness connector and depress the retaining tabs on the main harness connector and remove from mounting bracket.
8. Remove the main wiring harness from the unit.

Figure 4-5

Refer to Figure 4-6:

9. Disconnect the engine wiring harness from the start solenoid and the engine wiring. Mark each cable for reference.
10. Remove engine wiring harness from the unit.

NOTE: Pictures is for reference only, cable attachments will vary with engine model and type.

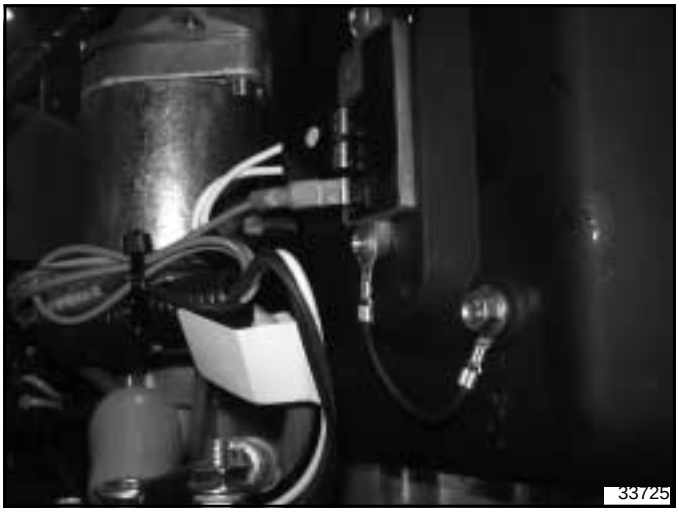


Figure 4-6

Wiring Harness Installation

Refer to Figure 4-7:

1. Lay out the main wiring harness and check all the connections for good crimps and that the plastic shielding is secured.
2. Mark all ends of the main wiring harness to ensure proper routing. Use the **"Main Harness Wiring Schematics"** on page 25 for locations of all connections.
3. Plug the engine wiring harness connector into the mounting bracket. Route all the branches of the wiring harness to the appropriate areas of the mower. Ensure that the each of the branches of the wiring harness are routed as close to the frame and tie down points as possible.

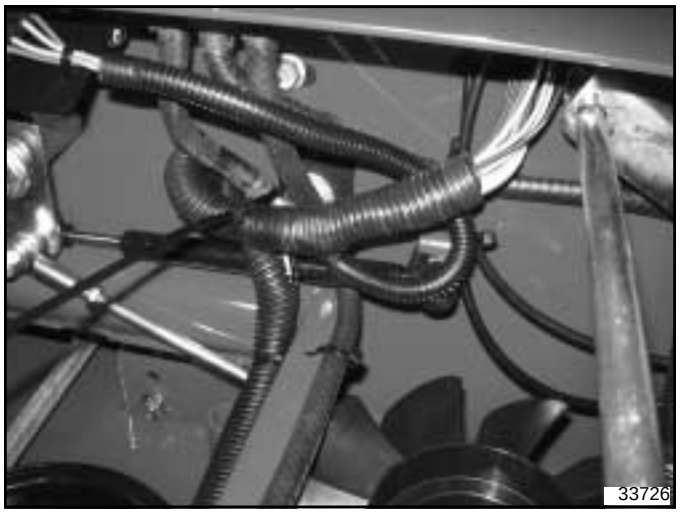


Figure 4-7

Refer to Figure 4-8:

4. Connect the wiring harness to the brake, seat, and neutral interlock switches. See **"Main Harness Wiring Schematics"** on page 25 for locations of all connectors.
5. Route the control cable though the bottom of the fender and connect all the main wiring harness connectors to the control panel.

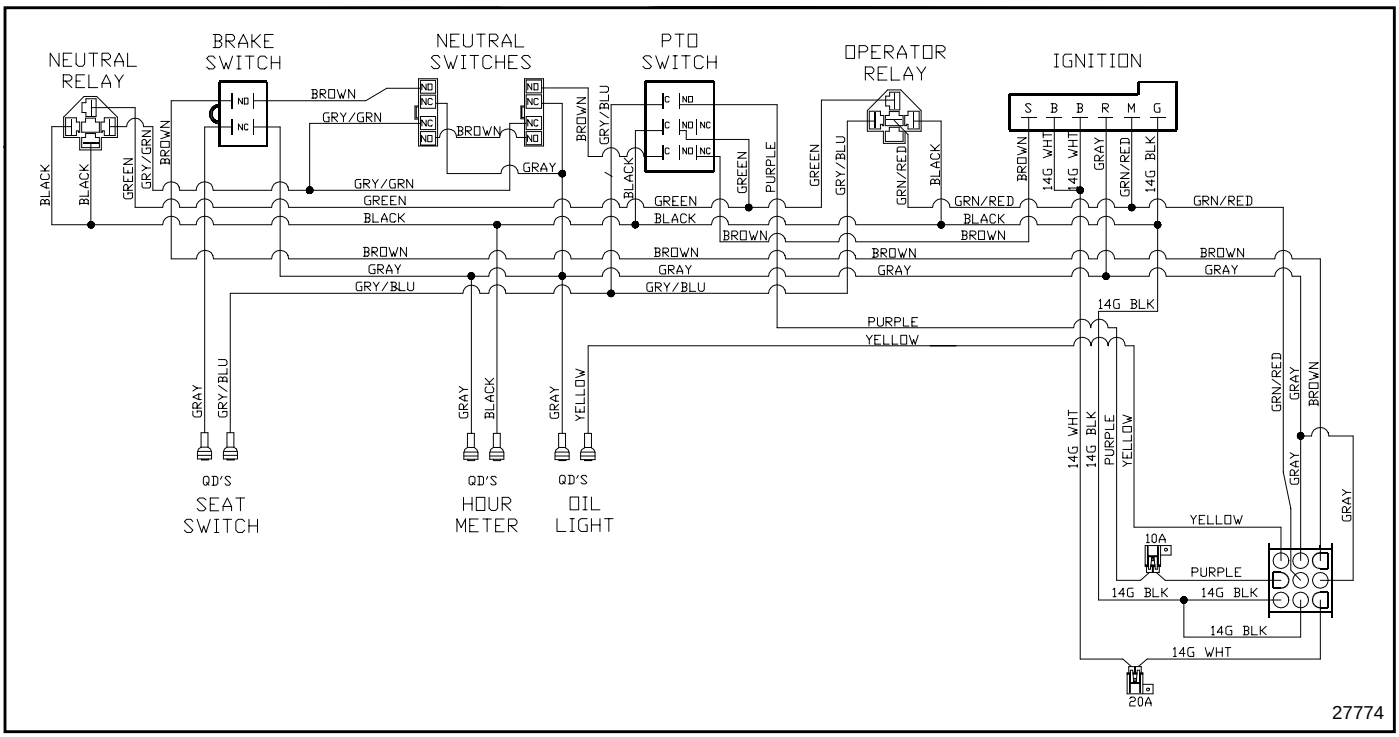
Figure 4-8

Refer to Figure 4-9:

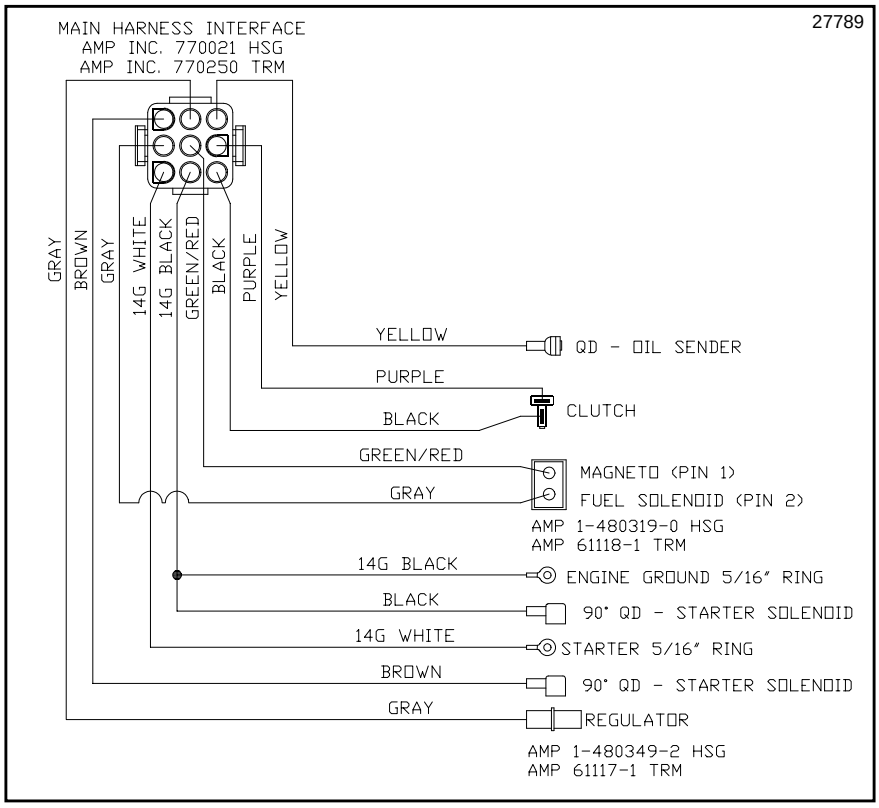
6. Lay out the engine wiring harness and check all the connections for good crimps and that the plastic shielding is secured.
7. Mark all ends of the engine wiring harness to ensure proper routing. Use the **"Engine Wiring Schematics"** on page 26 for locations of all connections.
8. Plug the engine wiring harness in to the start solenoid and engine wiring.
9. Plug the engine wiring harness into the main wiring harness connector.
10. Test and secure the main and engine wiring harness to the frame and tie down points.

Figure 4-9

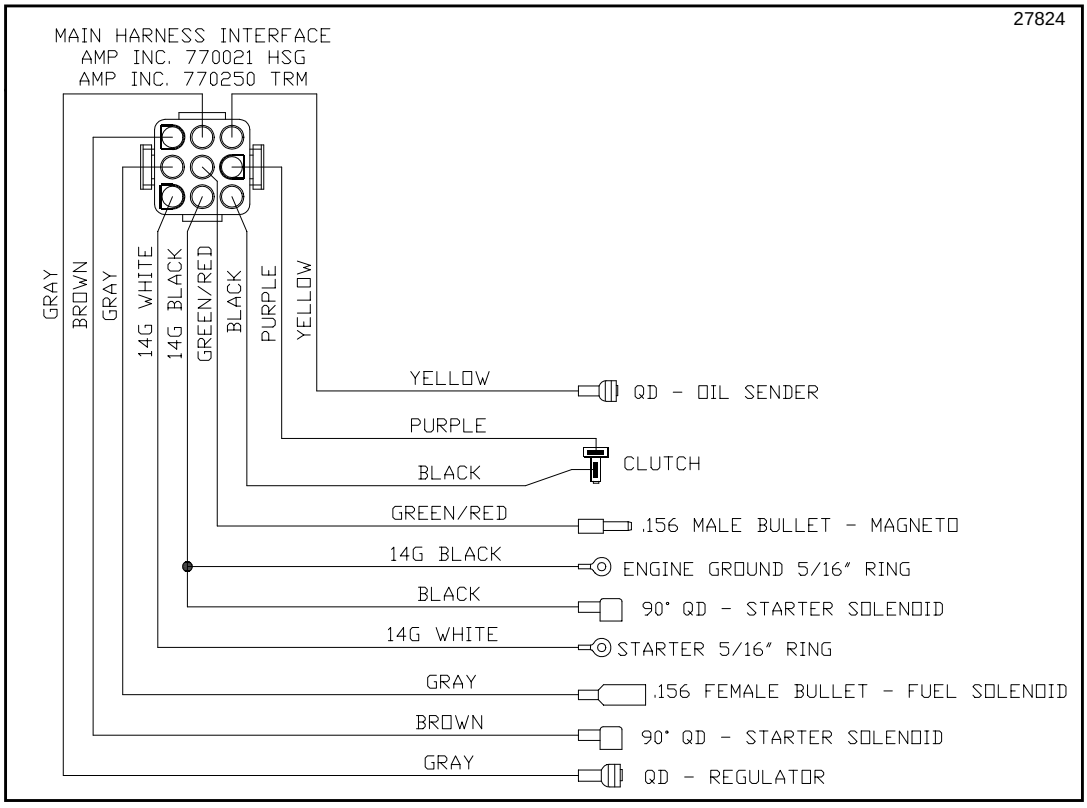
Main Harness Wiring Schematics



Engine Wiring Schematics



Briggs & Stratton Engine Wiring Schematics



Kawasaki Engine Wiring Schematics

Fuel Valve and Hose Removal

Refer to Figure 5-1:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. For ease of access, remove the seat assembly. See**"Seat and Latch Removal"** on page 13.
4. Disconnect the fuel line from the fuel filter and allow the tanks to empty into an appropriate waste fuel container. It will be necessary to lower the fuel line below the level of the fuel tanks to drain them.

Figure 5-1

Refer to Figure 5-2:

5. Remove fuel caps from tanks and insure that both tanks are fully empty and well ventilated. For best ventilation, allow the tanks to set overnight if possible to allow excess fuel to evaporate.
6. Cut and remove all the plastic zip ties securing the fuel line to the frame and steering components.

.

Figure 5-2

Refer to Figure 5-3:

7. With pliers pinch and hold the fuel line hose clamps that secure the fuel hoses to the valve block and slide them away from the valve block. Remove the hoses from the valve block.
8. While holding the valve block, loosen the jam nut securing the fuel valve. Remove the jam nut retaining washer from the valve handle and pull the valve block back while twisting upward to pull the handle through the pedestal base.
9. With pliers pinch and hold the fuel line hose clamps that secure the fuel hoses to the fuel tanks and slid them away from the fuel tank outlets. Remove the fuel lines from the fuel tank outlets.

Figure 5-3

Fuel Valve and Hose Installation

Refer to Figure 5-4:

1. Install the fuel line clamps on the hoses approximately 2 inches from the end of the fuel lines.
2. Install the fuel lines from the tanks and to the fuel filter. Route the fuel line to the fuel filter along the left or right hand tank fuel line based upon which side of the engine the fuel filter is installed.

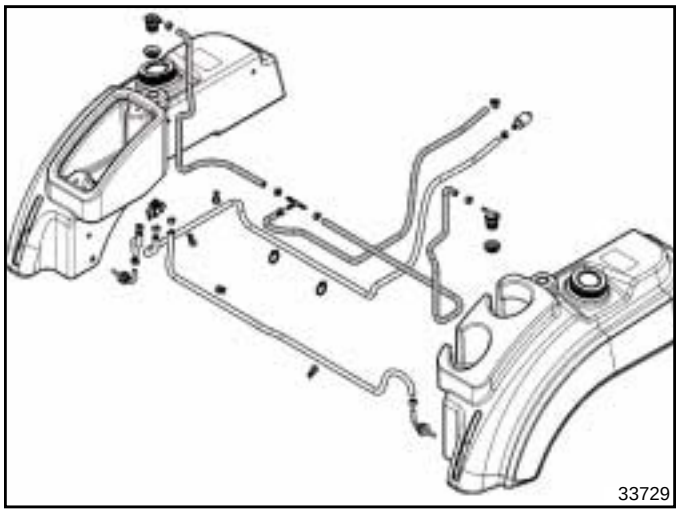


Figure 5-4

Refer to Figure 5-5:

3. Ensure that the fuel valve handle is centered and insert though the pedestal base. This will allow the fuel valve to turn towards the tank being used when installed.
4. Secure the fuel valve to the pedestal base with the jam nut retaining washer and tighten until snug against the pedestal base. Rotate the fuel valve handle to insure that the block will not turn while in use.
5. Install the fuel lines on the fuel valve block and with pliers secure the fuel lines with the fuel line clamps.

Figure 5-5

Refer to Figure 5-6:

6. Install the fuel line on the fuel filter and with pliers secure the fuel line with the fuel line clamp.
7. Install the left and right fuel tank lines on the fuel tank outlets and with pliers secure the fuel lines with the fuel line clamps.
8. Fill the tanks with a small amount of fuel and check the system for leaks. Secure the fuel lines with plastic zip ties.

NOTE: Insure not to kink the fuel line or over tighten the plastic zip ties while securing the fuel lines.

Figure 5-6

Fuel Tank Removal

Refer to Figure 5-7:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. For ease of access, remove the seat assembly. See**"Seat and Latch Removal"** on page 13.
4. Drain and disconnect the fuel line from the fuel tank outlet. See **"Fuel Valve and Hose Removal"** on page 27.

NOTE: For removal of the right hand fuel tank it will be necessary to remove the control panel. See **"Control Panel Removal"** on page 11.

Figure 5-7

Refer to Figure 5-8:

5. Loosen and remove the lower inside fuel tank bolt located just above the fuel tank outlet.
6. Loosen and remove the two upper fuel tank bolts that secure the fuel tank to the upper pedestal base.

Figure 5-8

Refer to Figure 5-9:

7. Loosen the three fuel tank rest bolts from the bottom of the fuel tank. For ease of access remove the rear drive wheel. See **"Rear Drive Wheel Removal"** on page 35.
8. Lift the front of the fuel tank and pull out slightly to remove the fuel tank outlet from the frame and remove the fuel tank.

Figure 5-9

Fuel Tank Installation

Refer to Figure 5-10:

1. Install the fuel tank outlet into the fuel tank. Insure that the tube of the outlet is installed and secured facing up and slightly forward.
2. Align the fuel tank outlet with the frame and set the tank on the fuel tank support arm. Secure the front of the tank by loosely installing the inner front tank bolt.

NOTE: Do not tighten bolts until all tank bolts have been installed and the fuel tank has been aligned.

Figure 5-10

Refer to Figure 5-11:

3. Align the fuel tank with upper pedestal and loosely install the two upper pedestal bolts.
4. Align and install the fuel tank support arm bolts and tighten snugly against the support arm.

Figure 5-11

Refer to Figure 5-12:

5. Tighten all fuel tank bolts snugly against the frame. Do not over tighten bolts as they will strip the inserts out of the fuel tank.
6. Install the fuel lines. See **"Fuel Valve and Hose Installation"** on page 28.

NOTE: For the installation of the right hand fuel tank it will be necessary to reinstall the control panel. See **"Control Panel Installation"** on page 12.

Figure 5-12

Front Caster Wheel Removal

Refer to Figure 6-1:

1. Ensure that control levers are set in the neutral position and park brake is set for safety.
2. Chock rear drive wheels to secure mower and prevent movement while repairs are made.
3. Loosen and remove the caster spindle hub cap bolt and remove the hub cap.

Figure 6-1

Refer to Figure 6-2:

4. Raise front of the mower main frame until the caster wheel pivot shaft is clear of the bearing housing to remove the caster wheel fork assembly.
5. With the caster wheel pivot shaft removed, slide the support bushing to the side and use a punch to tap the bottom bearing out. The support bushing will come out with bearing.

Figure 6-2

Refer to Figure 6-3:

6. With a punch tap the upper bearing out of the caster arm.
7. Loosen and remove the caster wheel axle nut and pull the axle bolt to remove wheel from the caster wheel fork assembly.

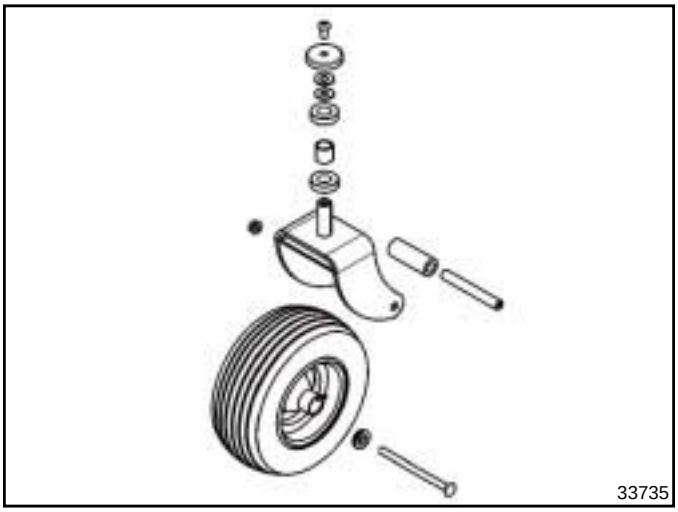


Figure 6-3

Front Caster Wheel Installation

Refer to Figure 6-4:

1. Align and install the wheel axle bolt though the fork, axle bushing, and wheel.
2. Secure the caster wheel fork assembly with the flanged axle nut.
3. Align and install the lower caster bearing into the bottom bearing housing. With a bearing set tool seat the bearing against the lower race.

NOTE: Ensure bearing collars are installed face down.

Figure 6-4

Refer to Figure 6-5:

4. Align the caster wheel pivot shaft with the lower bearing and lower the front of the mower main frame.
5. Install the bearing support bushing into the bearing housing over the shaft.

Figure 6-5

Refer to Figure 6-6:

6. Align and install the upper bearing into the bearing housing. With a bearing set tool seat the bearing against the upper race.
7. Install the pivot washer and caster spindle hub cap. Secure the caster spindle hub cap with bolt.

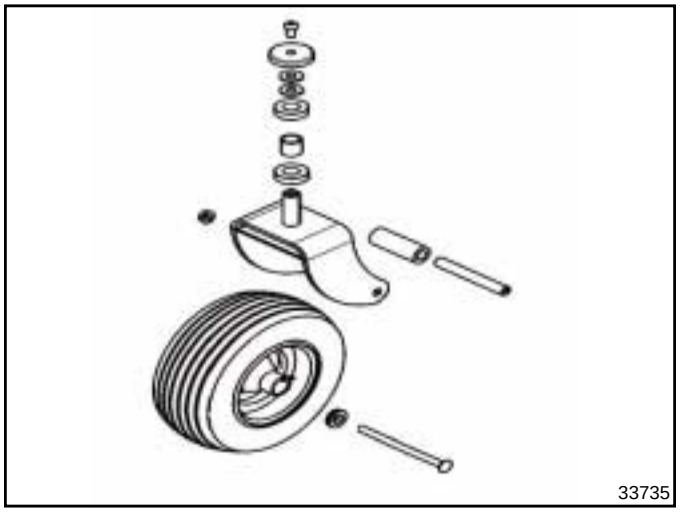


Figure 6-6

Front Axle Removal

Refer to Figure 6-7:

1. Chock rear drive wheels to secure mower and prevent movement while repairs are made.
2. Raise and secure the front of the mower. The front caster wheel assemblies may be removed to reduce the weight of the front axle during removal.
3. Unlock the front axle pivot and allow the axle to float freely, this will remove tension from the pivot lock for removal.

Figure 6-7

Refer to Figure 6-8:

4. Remove the floor panel to access the floor panel attachment bracket over the front end pivot mount. See **"Floor Panel Removal"** on page 15.
5. Loosen and remove the front axle pivot bolt from the floor panel attachment bracket.
6. Loosen and remove the floor panel retaining bolts on the back side of the floor panel attachment bracket and remove the attachment bracket.

Figure 6-8

Refer to Figure 6-9:

7. Slide the front pivot axle off the front end pivot mount.
8. Loosen and remove the deck strut attachment bolts and allow the struts to rest on the deck.
9. Loosen and remove the round head carriage bolts and nuts from the top of the front end pivot mount.
10. Loosen and remove the three front end pivot mount bolts one the front end pivot mount and remove the front end pivot mount from the unit frame.

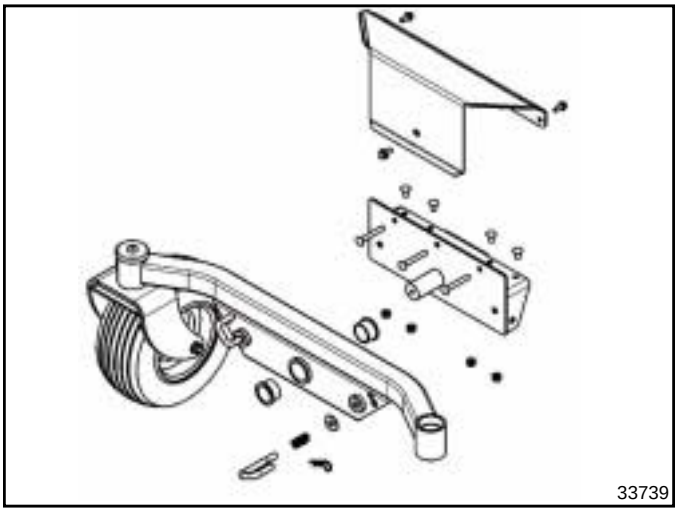


Figure 6-9

Front Axle Installation

Refer to Figure 6-10:

1. Align and install the front end pivot on the unit frame with the three front end pivot mount bolts. Do not tighten bolts at this time.
2. Align and install the round head carriage bolts in the top of the front end pivot mounts and secure with flanged lock nuts. Tighten the flanged lock nuts and the three front end pivot mount bolts.
3. Attach the deck struts to the front end pivot mount with the strut pivot bolts.

Figure 6-10

Refer to Figure 6-11:

4. Align and slide the front pivot axle onto the front end pivot mount.
5. Align and install the floor panel attachment bracket over the front end pivot mount and axle.
6. Secure the floor panel attachment bracket with to back side retaining bolts. Do not tighten at this time.
7. Secure the front axle pivot bolt in the front of the floor panel attachment bracket and tighten the two back side retaining bolts.

Figure 6-11

Refer to Figure 6-12:

8. Align and install front caster wheels. See **"Front Caster Wheel Installation"** on page 32.
9. Align and install the pivot lock tension spring in the front axle and insert the pivot lock pin.
10. Secure the pivot lock pin with retaining washer and cotter pin.

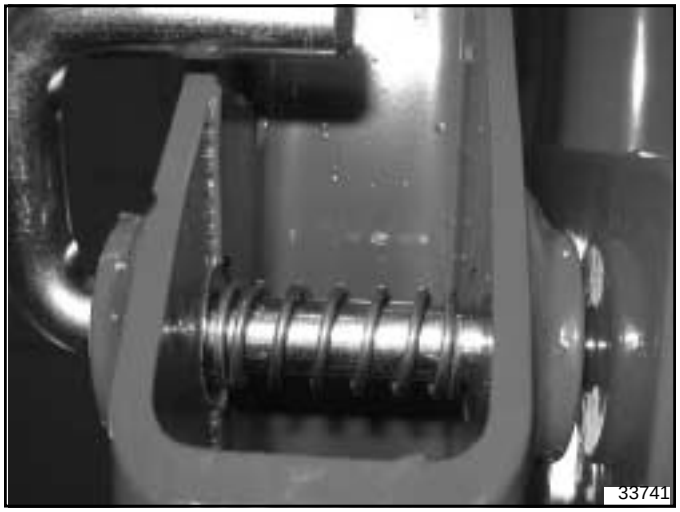


Figure 6-12

Rear Drive Wheel Removal

Refer to Figure 6-13:

1. Chock the front caster wheels to secure mower and prevent movement while repairs are made.
2. Loosen the rear drive wheel lug nuts. Do not remove at this time.
3. Raise and secure the rear of the mower.
4. Remove the rear drive wheel lug nuts and remove the wheel from the axle hub.

Figure 6-13

Rear Drive Wheel Installation

Refer to Figure 6-14:

1. Align and install the rear drive wheel on the axle hub.
2. Secure the rear drive wheel with wheel lug nuts and hand tighten flush into the rim. Ensure that the tapered side of the wheel lug nuts are installed facing the rim.
3. Lower the rear of the mower until the wheels are in firm contact with the ground. This will prevent slippage while tightening of the wheel lug nuts.
4. In a crossing patter tighten all the wheel lug nuts to approximately 48 ft/lbs.

Figure 6-14

Muffler Removal

Refer to Figure 7-1:

1. Chock wheels to secure mower and prevent movement while repairs are made.

NOTE: Muffler area may be hot from running. Take care when working in this area.

2. For ease of access remove the engine bumper guard. See **"Engine Bumper Guard Removal"** on page 16.

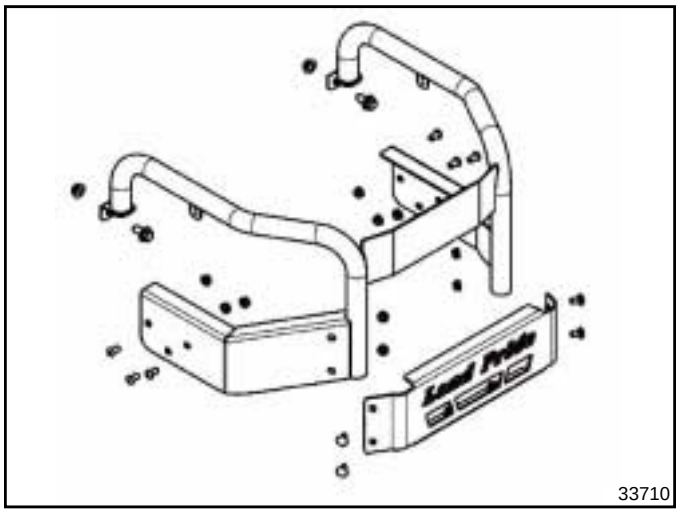


Figure 7-1

Refer to Figure 7-2:

3. Loosen and remove flanged retaining nuts from muffler at the engine exhaust. Remove muffler from the engine mount studs.

NOTE: Picture is for reference only as muffler will vary with engine type and model.

4. Remove the muffler gaskets from the muffler.

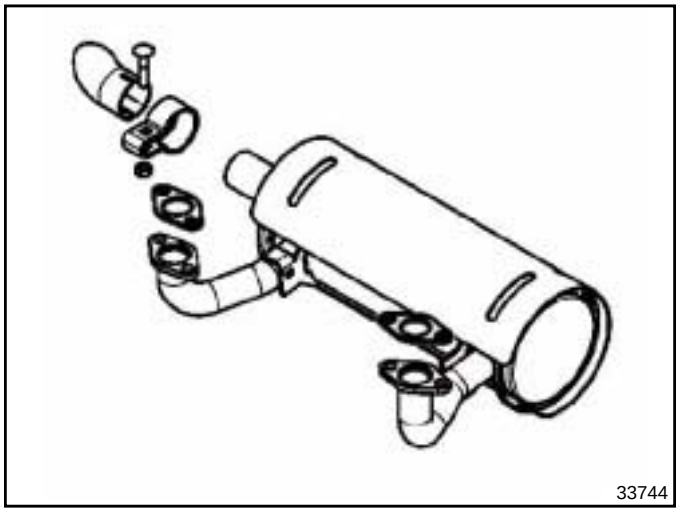


Figure 7-2

Muffler Installation

Refer to Figure 7-3:

1. Align and install new muffler gaskets on the muffler mounting studs on the engine.
2. Align and install muffler to the mounting studs and secure with flanged lock nut.

NOTE: Tighten the engine mounting nuts evenly to ensure positive gasket seal on the muffler.

3. Reinstall engine bumper guard. See **"Engine Bumper Guard Installation"** on page 16.

Figure 7-3

Engine Removal

Refer to Figure 7-4:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.

> **NOTE:** Ensure that mower is cooled before performing any repair around the engine and muffler to prevent accidental burning

3. For ease of access remove rear bumper guard. See **"Engine Bumper Guard Removal"** on page 16.
4. Open engine oil drain valve and drain the engine oil into an appropriate waste oil container.

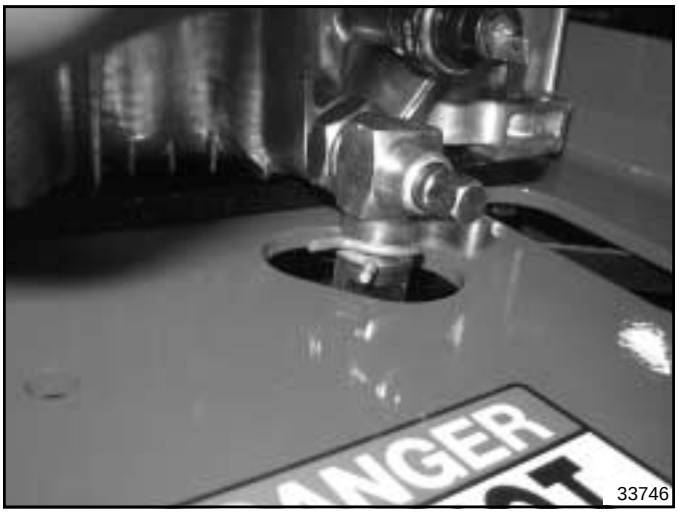


Figure 7-4

Refer to Figure 7-5:

5. Disconnect the fuel line from the fuel filter and drain fuel tanks as needed. Open fuel drain valve on the engine carburetor and drain fuel from the engine. See the engine manual for more information.
6. Cut and remove the plastic zip ties on the throttle cable, choke cable and connecting wiring harness.
7. Loosen engine clamps on both the throttle and choke cables. Mark each cable for reference and disconnect the throttle and choke cables from the engine.
8. Disconnect the wiring harness from the engine: Engine ground, start solenoid ground, magneto, fuel shut off solenoid, regulator, start solenoid power supply, starter main power, clutch, and oil pressure sender wire.

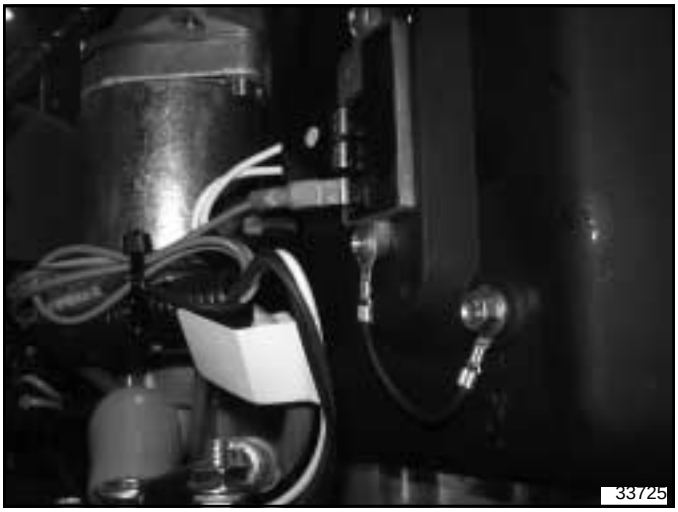


Figure 7-5

Refer to Figure 7-6:

9. Remove floor panel to access the over center latch. See **"Floor Panel Removal"** on page 15. Loosen deck belt tension by pulling the securing pin on the over center latch assembly and rotate counter clockwise to disengage the latch. Remove belt from the clutch.
10. Loosen and remove the idler tensioner arm to provide enough slack in the hydraulic drive belt to roll the belt off and remove the hydraulic drive belt.
11. Loosen and remove the clutch stop and engine bolts securing the engine. Take care in removing these bolts as they are installed into the engine block assembly.
12. With a hoist on the engine lift points, lift the engine assembly out of the frame. The clutch, hydraulic drive pulley, and air cleaner assembly may be removed after engine removal.

Figure 7-6

Engine Installation

Refer to Figure 7-7:

1. Assemble components for the unit specification to the engine. Install muffler, air cleaner, oil drain valve, and oil sender to the engine. Temporarily install the engine pulley spacer, hydraulic drive pulley, and the clutch. Do not tighten the clutch assembly until reinstalling the belts.

> **NOTE:** Aligning studs may be installed in the engine block to assist in assembly of the engine to the frame. The alignment stud is a 3/8"-16 X 2" long bolt with the head rounded off.

2. Install engine spacer plate with the cut out to the front of the engine and install the alignment studs on two opposing corners of the engine though the engine spacer plate.
3. With a hoist on the engine lift points, lower the engine assembly into the frame. Align the clutch stop rotation tabs to fit though the frame. Lower the engine alignment studs into the main frame and ensure that the engine is centered on the frame.

Refer to Figure 7-8:

4. Remove the alignment studs and secure the engine assembly to the main frame with washers, spring lock washers and bolts. Apply two drops of blue loctite to the threads of each bolt and tighten until the spring lock washer is fully compressed against the washers, approximately 15-18 ft/lbs.
5. Route and connect the wiring harness to the engine: Engine ground, start solenoid ground, magneto, fuel shut off solenoid, regulator, start solenoid power supply, starter main power, clutch, and oil pressure sender wire. See **“Wiring Harness Installation”** on page 24.
6. Route and install the throttle and choke cables to the engine. See **“Control Panel Installation”** on page 12.

Refer to Figure 7-9:

7. Align and install the hydraulic drive belt to the engine assembly. See **“Ground Drive Belt Removal & Installation”** on page 64.
8. Align and install clutch and deck drive belt. See **“Clutch Installation”** on page 40.
9. Fill the engine with 10w30 motor oil. See the engine manual for more information for engine specs.
10. Connect the fuel line with the engine fuel filter and secure with fuel line clamp.
11. Test unit for proper operation and set the engine to correct idle and run RPM. See the engine manual for more information for specific engine settings.
12. Secure all cables, hoses and wiring to the frame mounting points with plastic zip ties.

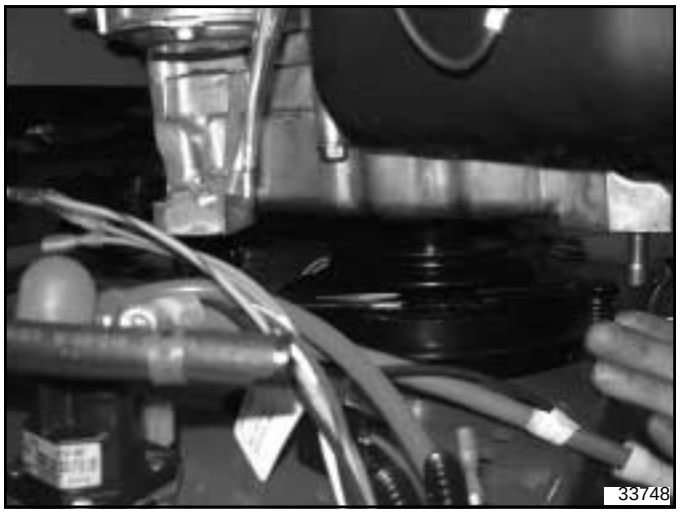


Figure 7-7

Figure 7-8

Figure 7-9

Clutch Removal

Refer to Figure 7-10:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. Raise and secure the rear of the unit for ease of access to the clutch assembly.
4. Disconnect the clutch harness pig tale from the engine wiring harness.

Figure 7-10

Refer to Figure 7-11:

5. To prevent accidental start, unplug the coil wires on both spark plugs prior to removing the belt.
6. Remove the floor panel to access the over center latch. See "**"Floor Panel Removal"** on page 15.
7. Loosen deck belt tension by pulling the securing pin on the over center latch assembly and rotate counter clockwise to disengage the latch. Remove belt from the clutch.

Figure 7-11

Refer to Figure 7-12:

8. Loosen and remove the clutch retaining bolt.

NOTE: Care should be taken when removing the clutch retaining bolt to prevent damage to the threads on the engine output shaft.

9. Pull down on the clutch and with a rubber mallet tap the clutch lightly on the sides to loosen it from the engine output shaft. Remove clutch.

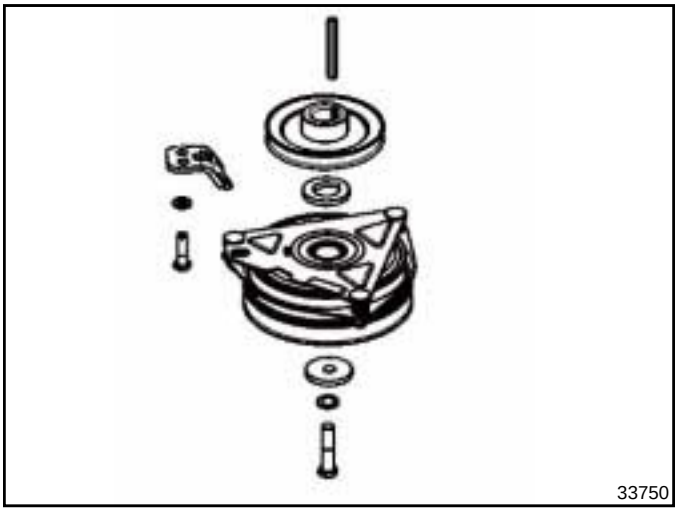


Figure 7-12

Clutch Installation

Refer to Figure 7-13:

1. To prevent accidental start, unplug the coil wires on both spark plugs prior to the installation of the clutch.
2. Insure the pump drive pulley is fully seated against the engine output shaft stop and that the key is flush with the bottom of the pulley. A light coat of anti-seize may be applied to the engine output shaft to ease future disassembly.
3. Align and install the clutch with the drive pulley to the bottom and the stop rotation slot aligned to the front. Install the clutch stop rotation bracket to prevent turning of the clutch.

Figure 7-13

Refer to Figure 7-14:

4. Install the clutch retaining bolt with both the flat washer and lock washer thought the clutch hub. Apply a small amount of blue loc-tite to the end of the bolt threads prior to installation.
5. Tighten the clutch retaining bolt to 50 ft/lbs.
6. Install belt on clutch ensuring correct belt routing per **“Deck Drive Belt Removal & Installation”** on page 64.

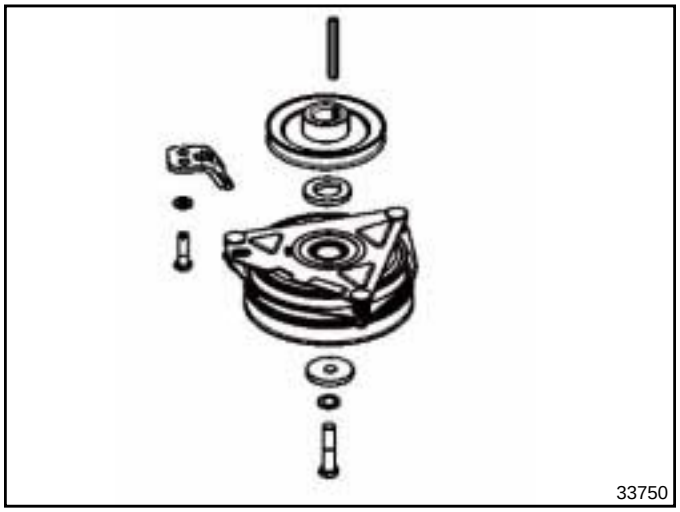


Figure 7-14

Refer to Figure 7-15:

7. Tighten belt by rotating the over center latch assembly clockwise until the latch assembly engages. Secure the over center latch with the latch pin.
8. Route and connect the clutch harness pig tail to the engine wiring harness. Secure wiring with zip ties as needed to prevent damage from rotation.
9. Reinstall the coil wires on both spark plugs and test the system for correct operation.

Figure 7-15

Transaxle Removal

Refer to Figure 7-16:

1. Chock wheels to secure mower and prevent movement while repairs are made.
2. Disconnect battery to prevent accidental shock. See **"Battery Assembly Removal"** on page 22.
3. Raise and secure the rear of the unit for ease of access to the transaxle assemblies.
4. Remove the deck drive clutch and belt. See **"Clutch Removal"** on page 39.

Figure 7-16

Refer to Figure 7-17:

5. Loosen pump drive tensioner arm from the unit frame to provide enough slack to remove the belt from the tensioner pulley.
6. Remove pump drive belt from the pump drive pulley on the engine output shaft and from the transaxle drive pulleys.

Figure 7-17

Refer to Figure 7-18:

7. Disconnect the park brake link assembly from the parking lever arm on the transaxle. See **"Park Brake Removal"** on page 7.
8. Disconnect the bypass rod from the bypass rod spring assembly by pulling the hair cotter pin and pulling the rod from the rear of the unit.

Figure 7-18

Refer to Figure 7-19:

9. Loosen and disconnect the drive control rod from the pump control bracket.
10. Drain transaxle oil into an appropriate waist oil container and disconnect the expansion tank from the top of the transaxle.

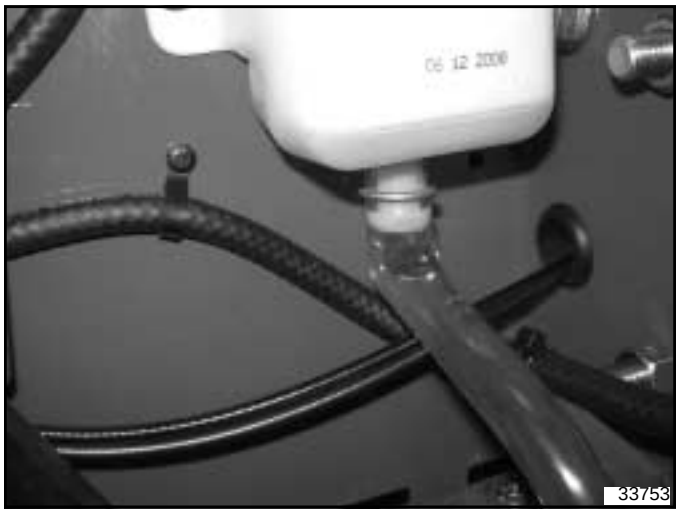


Figure 7-19

Refer to Figure 7-20:

11. With a floor jack or other lift devise, support the trans-axle to be removed.
12. Loosen and remove the trans-axle support bolts on the axle.
13. Loosen and remove the front and rear trans-axle support bolts and lower trans-axle from unit.

Figure 7-20

Transaxle Installation

Refer to Figure 7-21:

1. Assembly the bypass rod spring assembly by sliding the spring over the release bracket to stop. Insert the spring slide bracket into spring with the locking tab down until secure in the release bracket slide slot.
2. Install the bypass rod spring assembly onto the transaxle and secure with washer and cotter pin.

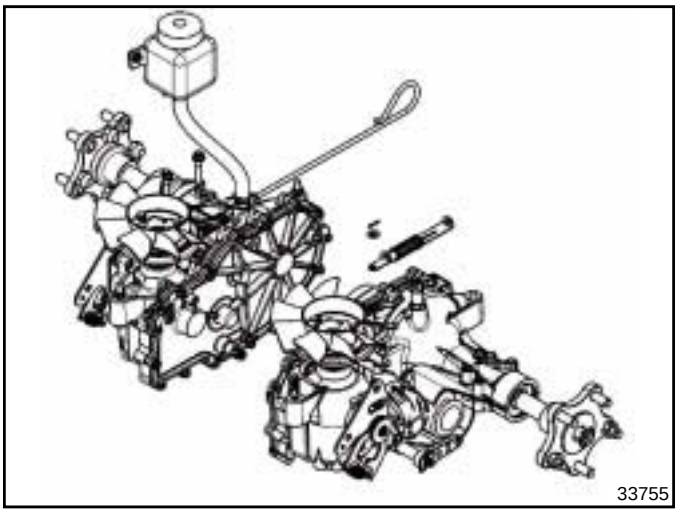


Figure 7-21

Refer to Figure 7-22:

3. With a floor jack or other lift devise, support the transaxle and align into frame.
4. Install the rear and front transaxle support bolts, secure with flanged locknuts.
5. Install the transaxle support bolts on the axle, secure with flanged locknuts.

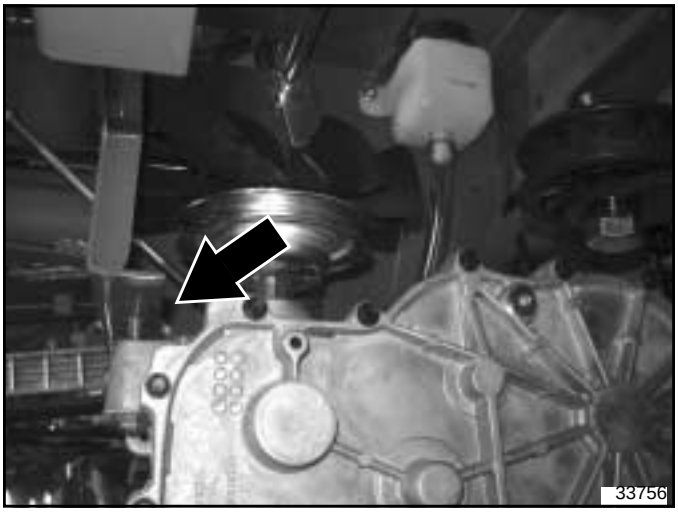


Figure 7-22

Refer to Figure 7-23:

6. Align and connect the park brake link assembly to the parking lever. See **"Park Brake Installation"** on page 8.
7. Align and install the drive control rod to the pump control bracket on the transaxle control lever.
8. Align and install the bypass rod in frame assembly and connect to the bypass rod spring assembly with hair cotter pin.

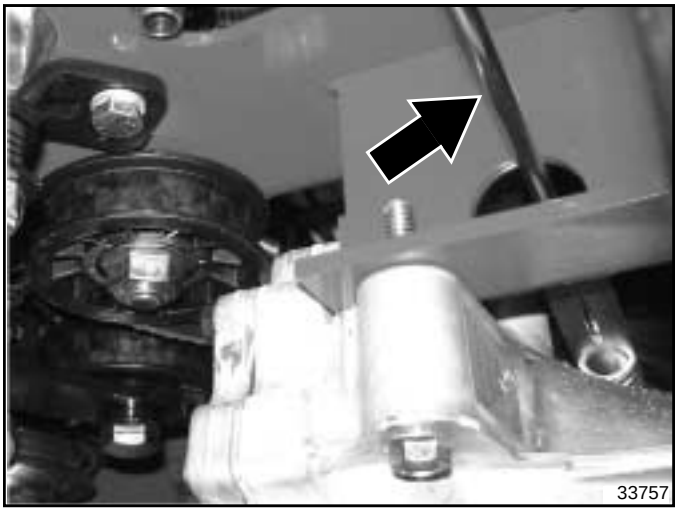


Figure 7-23

Refer to Figure 7-24:

9. Connect and secure the expansion tank to the top of the transaxle with spring hose clamp. Fill transaxle with SAE 20W-50 engine oil.
10. Install belt on drive pulleys ensuring correct belt routing and tension spring. See **"Ground Drive Belt Removal & Installation"** on page 64.

Figure 7-24

Refer to Figure 7-25:

11. Reinstall the deck belt and clutch. See **"Clutch Installation"** on page 40.
12. Install rear drive wheel. See "**"Rear Drive Wheel Installation"** on page 35.
13. Reconnect battery and test drive system for correct operation.

Figure 7-25

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WARNING

Unless specifically required, **Do Not** *have engine running when servicing or making adjustments to the mower. Place both control levers in the park position and remove ignition switch key. Read and observe all* **"Safety Warnings"** *and* **"Important Notes"** *in this manual.*

Repairs or maintenance requiring engine power should be performed by trained personnel only. To prevent carbon monoxide poisoning, be sure proper ventilation is available when engine must be operated in an enclosed area.

Your Zero Turn Mower was adjusted before it left the factory and checked for proper operation during pre-delivery set-up. However, break-in wear and continued use can cause some adjustments to change.

- Be alert for unusual noises while operating the mower. They could be signaling a problem.
- Visually inspect for abnormal wear or damage while servicing and making adjustments to the mower.

Proper servicing and adjustment is the key to the long life of any implement. With careful inspection and routine maintenance, you can avoid costly downtime and repair.

WARNING

Keep your mower clean. Remove heavy trash and clippings from mower. Keep all moving parts, hydraulic system, engine cooling system, and exhaust system clean of trash and clippings. Accumulation of trash and/or clippings can cause fires, hydraulic overheating and excessive belt wear.

Clear away heavy build-up of grease, oil, and dirt. Especially clean in the areas around oil openings, fuel openings, and air inlets. Minute dust particles are abrasive to close-tolerance engine and hydraulic components.

Some repairs require the assistance of a trained service mechanic and should not be attempted by unskilled personnel. Consult your Land Pride service center when assistance is needed.

Torque Requirements

Refer to **"Torque Values Chart"** on page 79 to determine correct torque values when tightening hardware. See **"Additional Torque Values"** at bottom of chart for exceptions to standard torque values.

Tire Pressure

Before considering any adjustment, check tire air pressure. Unequal tire pressure will cause mower to drift to one side. Refer to **"Tire Inflation Chart"** on page 79.

Front Floating Axle

Refer to Figure 3-1:

The front axle on the ZSR Models will pivot. Simply lock the axle in place with locking pins (#1 & #2) to keep the axle from pivoting or unlock the axle to allow the axle and front wheels to float with the contour of the ground.

WARNING

Make sure blade engagement switch is (OFF), switch key is (OFF) and removed from ignition switch, control levers are (OUT), and park brake is (ON) before making adjustments.

WARNING

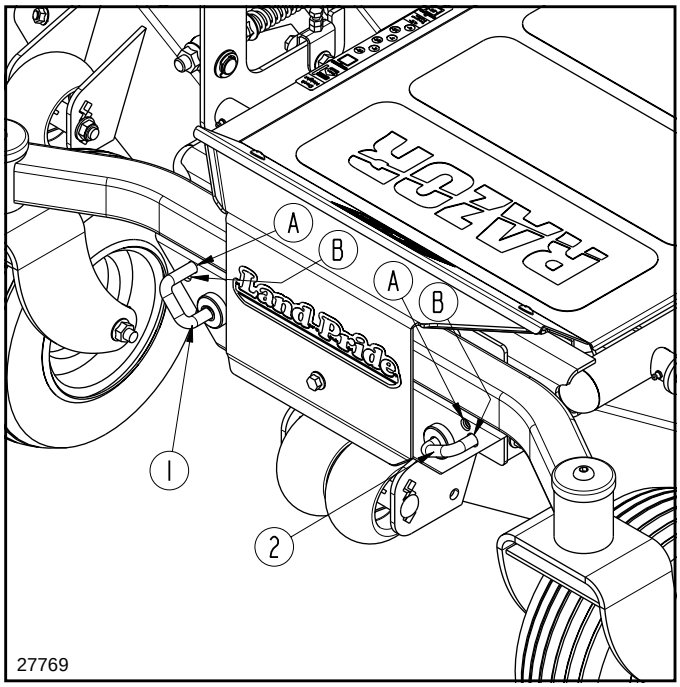
Lock front axle before lifting mower front. Body extremities can easily become pinched while lifting the mower's front if axle is not locked.

Lock Front Axle

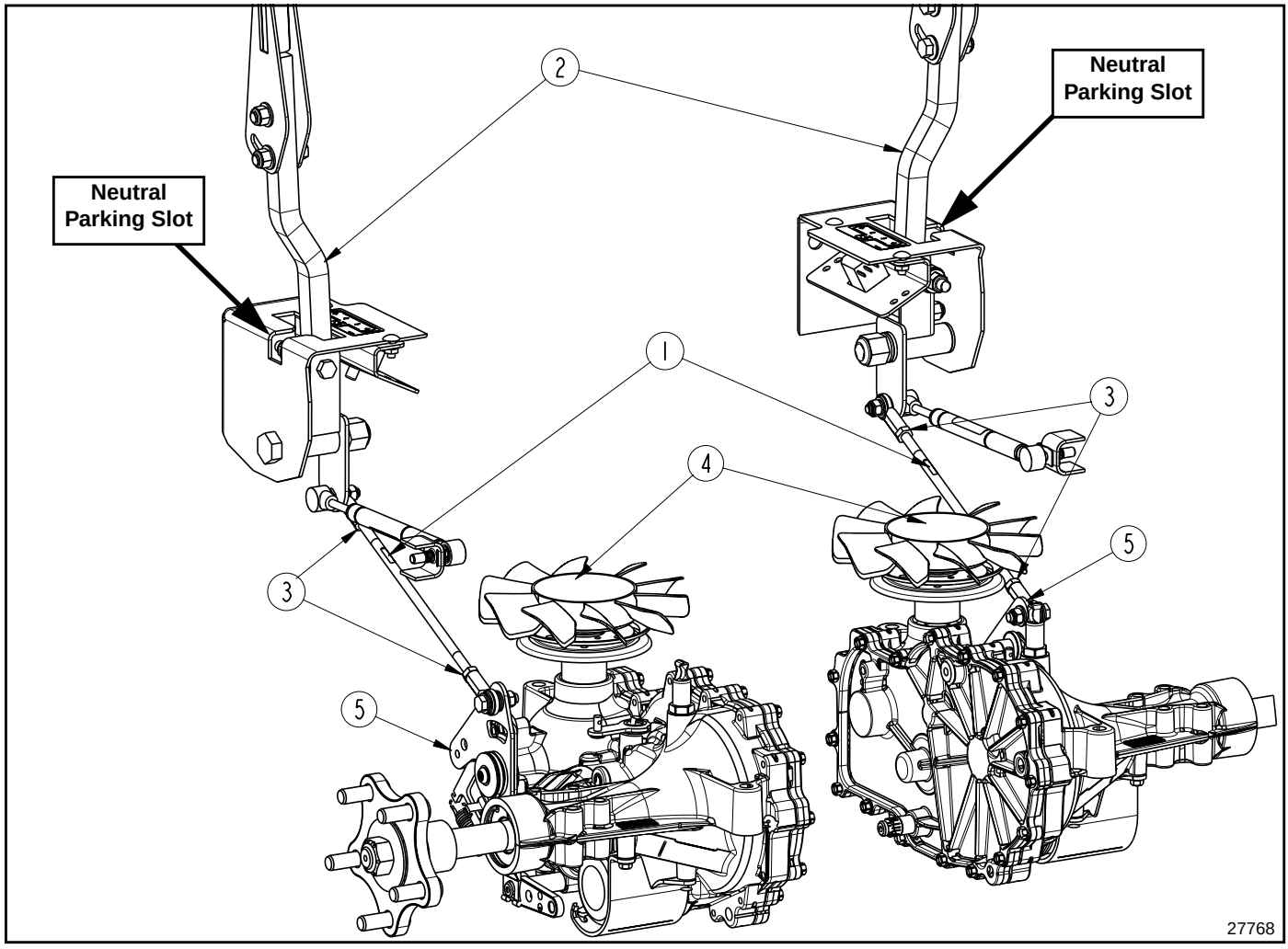
1. Pull locking pins (#1 & #2) out of holes (A) and rotate pins down to holes (B).
2. If spring loaded pins do not fully engage, they will automatically engage when front end pivots into proper alignment. This will happen during operation.

Unlock Front Axle Pivot

1. Park all four wheels on a flat level surface.
2. Pull locking pins (#1 & #2) out of holes (B) and rotate pins to locate in holes (A).



Pivot Locking Device (ZSR Models Only)
Figure 3-1



Steering Control Linkage
Figure 3-2

Steering Adjustments

The steering levers on the mower may over time require readjusting. Some adjustments can be made now to make operating the mower more comfortable.

Lower Control Lever

Refer to Figure 3-2:

The hydrostatic drive system is designed with spring return pump arms (#5) that will return the lower steering control levers (#2) to neutral when released. If control levers do not return to neutral position when released, adjust length of pump linkage rods (#1) as follows:

WARNING

Make sure mower is turned (OFF) before making adjustments to pump linkage rods.

1. Disengage blade switch and turn ignition switch off.
2. Position control levers in neutral position as shown.

NOTE: Step 3 is not required but may be done if transaxle fan blades (#4) interfere with loosening jam nuts (#3).

3. Remove fan mounting hardware and fans (#4) if jam nuts (#3) are not easily accessible.
4. Loosen jam nuts (#3) at both ends of the linkage rods by 5 or more full turns (approximately 1/4").
5. Using the flat area (#1) on the linkage rods, rotate rods to lengthen or shorten them until the levers align with the neutral parking slots.
6. Tighten jam nuts (#3) at both ends to lock linkage rods in place.
7. If the transaxle fans were removed, reinstall them and tighten their hardware to the correct torque.
8. Start mower engine and test control lever alignment by moving the levers forward and backward before returning them to neutral position. The pump linkage rods are properly adjusted if the lower control levers are aligned with the neutral parking slots when released.

Upper Control Lever

IMPORTANT: Make sure lower control levers have been adjusted before adjusting upper control levers. See page 47 for lower control lever adjustments.

The upper control levers may be adjusted while in neutral position for height, reach, and forward travel to fit the operator's steering comfort zone.

Height Adjustment

Refer to Figure 3-3:

1. Adjust upper control levers (#1) vertically by removing bolts (#3), flat washers (#4), and locknuts (#5) that attach upper control levers (#1) to the lower control levers (#2).
2. Reposition upper control levers to a height that fits the operator's personal preference.
3. Reassemble bolts, flat washers, and locknuts in the same order they were removed without tightening them.

Reach Adjustment

Refer to Figure 3-3:

The upper control levers (#1) can be adjusted forward or rearward to make steering more comfortable.

NOTE: Adjust the seat to operate the deck pedal comfortably before making the **"Reach Adjustment"**. See **"Seat Adjustment"** on this page for instructions.

1. Loosen mounting bolts (#3) and pivot upper control levers (#1) forward or backward to fit operator's personal reach preference. Skip to step 3 if reach is satisfactory.
2. If reach comfort zone can not be achieved, then try switching the right upper control lever with the left upper control lever as follows:
   a. Remove bolts (#3), flat washers (#4), and locknuts (#5).
   b. Switch right control lever with left control lever and reassemble bolts, flat washers, and locknuts in the same order they were removed without tightening them.
   c. Pivot upper control levers forward or backward to fit operator's personal reach preference.
3. Verify that the control levers align with each other when in neutral and then tighten bolts (#3) to the correct torque.

Forward Travel Adjustment

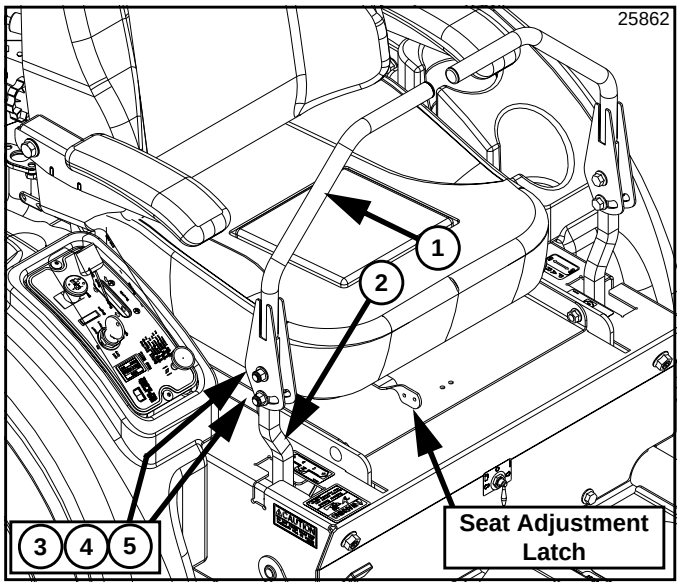
Refer to Figure 3-3:

"Reach Adjustment" instructions adjust the upper control levers to be equally aligned while in neutral. However, with this adjustment, the mower may want to steer slightly to the right or left when pushing the levers equally forward.

Make the following adjustments if you prefer to have the upper control levers equally aligned while in forward travel position instead of neutral position:

1. While driving forward, make the necessary steering correction required to make the unit go straight and take careful notice of how the upper control levers are positioned. (The distance one lever is ahead of the other to make the mower travel straight.)
2. Stop the mower on a level surface, place control levers in neutral, set park brake **(ON)**, shut power off, and remove switch key.
3. You can either adjust the trailing lever forward by the distance it was trailing or adjust the leading lever back by the distance it was leading.
   a. Loosen mounting bolts (#3) on the side to be adjusted.
   b. Reposition the lever forward or backward by the distance it was trailing or leading.
   c. Retighten bolts (#3) to the correct torque.

   Example:
   If the right control lever is one inch ahead of the left control lever, stop the unit and either adjust the right upper control lever back one inch or adjust the left upper control lever forward one inch.



Control Lever Adjustment (Deluxe Seat Shown)
Figure 3-3

Seat Adjustment

Refer to Figure 3-3:

The seat should be adjusted forward or rearward to a comfortable position to operate the deck lift pedal. Move seat adjustment latch (located under the seat) to the left and then move the seat forward or rearward. Once adjusted, return latch to the locked position.

The arm rest can be adjusted up or down to a suitable arm rest height. Turn the knobs located behind the seat to raise or lower the arms.

Ground Drive Belt Adjustment

Refer to Figure 3-4:

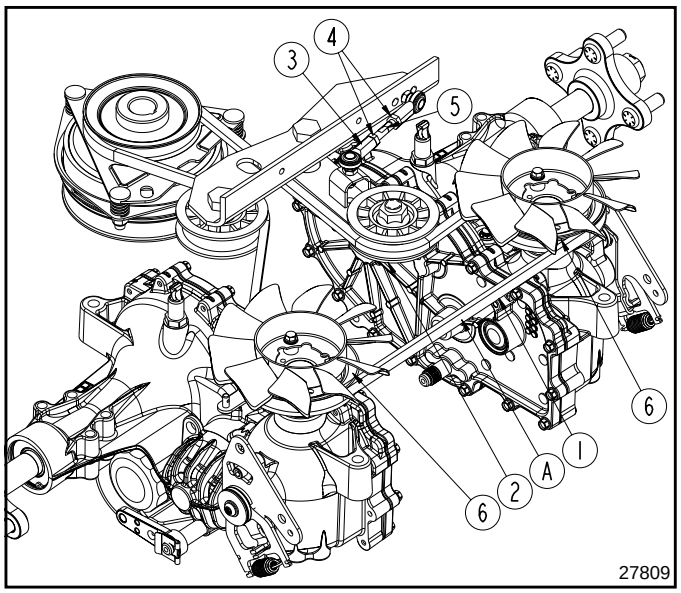
The ground drive belt (#1) is tensioned at the factory and will require readjustment as the belt stretches from wear. Replace belt when it becomes excessively worn or damaged. Instructions for replacing the ground drive belt are provided on page 64.

IMPORTANT: Do not over tension drive belts to compensate for a badly worn belt or pulley.

An over tensioned belt can cause the belt and drive components to break prematurely resulting in a safety hazard to the operator and bystanders.

An under tensioned belt can cause the belt to slip and become damaged.

1. To check tension of drive belt (#1), apply force with a tension tester to the belt mid span (point A between pump pulleys) until the belt deflects 1/4". The force required to get this deflection should range between 7 and 10 lbs.
2. Adjust take-up assembly (#3) until 7 to 10 lbs. of belt tension is achieved:
   a. Loosen jam nuts (#4) and rotate take-up rod (#5) until drive belt is tensioned properly.
   b. When adjustment is complete, keep take up rod from turning any farther and retighten jam nuts (#4) to the correct torque.



Ground Drive Belt Adjustment
Figure 3-4

Deck Drive Belt Adjustment

Refer to Figure 3-5 & Figure 3-6:

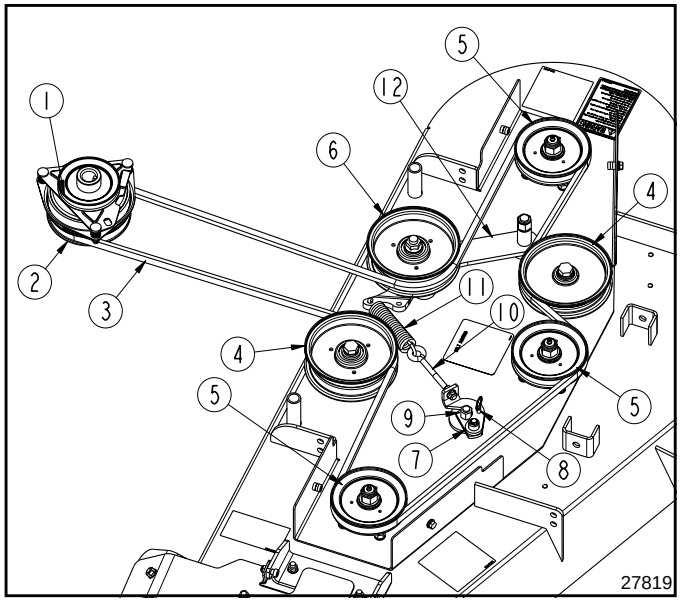
The deck belt (#3) remains in constant tension by means of the spring tensioned idler (#6). If belt slips under normal operating load conditions, retention spring (#11) by tightening up eyebolt (#10). Replace deck belt when it becomes excessively worn or damaged. Instructions for replacing the deck drive belt are provided on page 64.

With deck height set at 3", check length of deck drive extension spring (#11) to verify if belt tension is correct. Installed spring length should be 4 3/4" +/- 1/8" (See Figure 3-6). Vary spring length by adjusting length of eye bolt (#10). Additional adjustments to the spring length can be made by changing which hole in Arm (#12) the spring in attached. There are 2 holes for this adjustment.

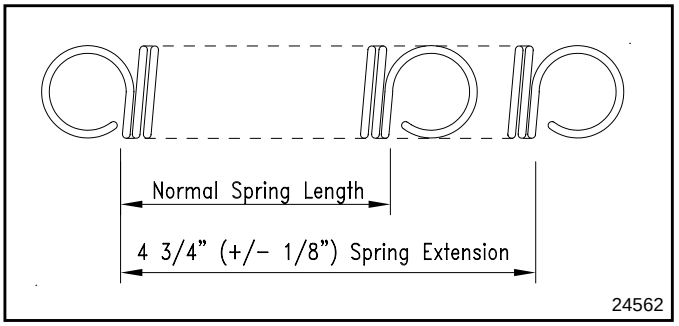
IMPORTANT: Do not over tension drive belts to compensate for a badly worn belt or pulley.

IMPORTANT: Excessive belt tension may lead to premature damage of belt and drive components and is also a safety hazard to the operator and bystanders.

Not enough belt tension may lead to premature belt damage due to excessive belt slippage.



Deck Drive Belt Adjustment
Figure 3-5



Deck Drive Belt Adjustment
Figure 3-6

Deck Adjustments

The mower deck has three areas that may need to be checked occasionally and adjusted when needed.

- Deck Cutting Height And Leveling
- Deck Lift Assist Springs
- Anti-Scalp Rollers

WARNING

Make sure blade engagement switch is (OFF), switch key is (OFF) and removed from ignition switch, control levers are (OUT), and park brake is (ON) before making adjustments.

Deck Cutting Height And Leveling

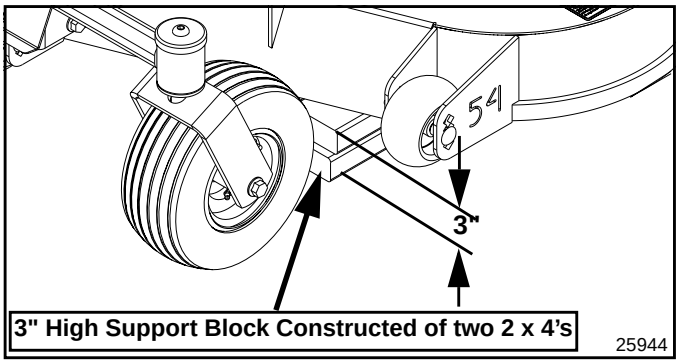
When level, the bottom edge of the deck should be 3" above ground level with deck stop (#1) set at 3 1/4**"** cutting height. If the deck cutting height is not properly adjusted, readjust deck height as follows:

1. Check tire pressures to make certain they are properly inflated.

NOTE: Refer to **"Tire Inflation Chart"** on page 79 for correct tire pressures.

Refer to Figure 3-7:

2. Park unit on a flat level surface.
3. Raise deck fully up.
4. Position blade cutting height at 3 1/4" by placing 3" high deck support blocks under the deck edge in three locations. (Two stacked 2" x 4" x 5" or longer boards may be used to make one 3" high block)
   a. Place one 3" high support block under the deck's front edge in-line with the far left blade spindle.
   b. Place a second 3" high support block under the deck's front edge in-line with the right blade spindle.
   c. Center a third 3" high support block under the center of the deck's back edge.
5. Remove deck height adjusting stop (#1) shown in Figure 3-8 on page 51 and lower deck onto the support blocks.



Blade Cutting Height will be 3 1/4"
When Blocking Deck Edge 3" Above Ground Level
Figure 3-7

Refer to Figure 3-8 & Figure 3-9 on page 51:

IMPORTANT: Spring assist trunnion (#12) is factory set and should not require field adjustment.

6. Back 3/4" flange nuts (#7 & #9) four or more turns away from deck lift trunnion (#8).
7. Back 5/8" flange nuts (#18 & #20) four or more turns away from spring assist trunnion (#19).
8. Loosen adjuster jam nuts (#15 & #24) and adjuster yoke whiz nuts (#27 & #28).
9. Loosen adjuster screws (#14 & #23) until adjuster yokes (#16 & #25) can move up and down freely.
10. Set cutting height at 3 1/4" by turning deck stop (#1) around so that its flat side is against stop handle (#2) and then place deck stop into the 3**"** cutting height hole (#3) in deck height gauge bar (#4) (See deck height indicator (#5) to locate position of 3" hole.
11. Tighten deck lift chains (#30, #26, #29 & #17) in the order provided below:

IMPORTANT: When completed, all lift chains will be tight, the deck will be resting on all 3" support blocks and stop handle will be against the deck stop.

Front Left Lift Chain #30

a. Adjust flange nut (#7) against trunnion (#8) until lift chain (#30) on the front left side is tight, stop handle (#2) is against deck stop (#1) and deck is still resting on the support blocks.
b. After flange nut (#7) has been properly adjusted, tighten flange nut (#9) to the proper torque.

Front Right Lift Chain #26

a. Make sure adjuster yoke (#25) moves freely.
b. Tighten adjuster screw (#23) until lift chain (#26) on the front right side is tight and the deck is still resting on the support blocks.
c. Tighten adjuster jam nut (#24) & yoke nuts (#27).

Back Left Lift Chain #29

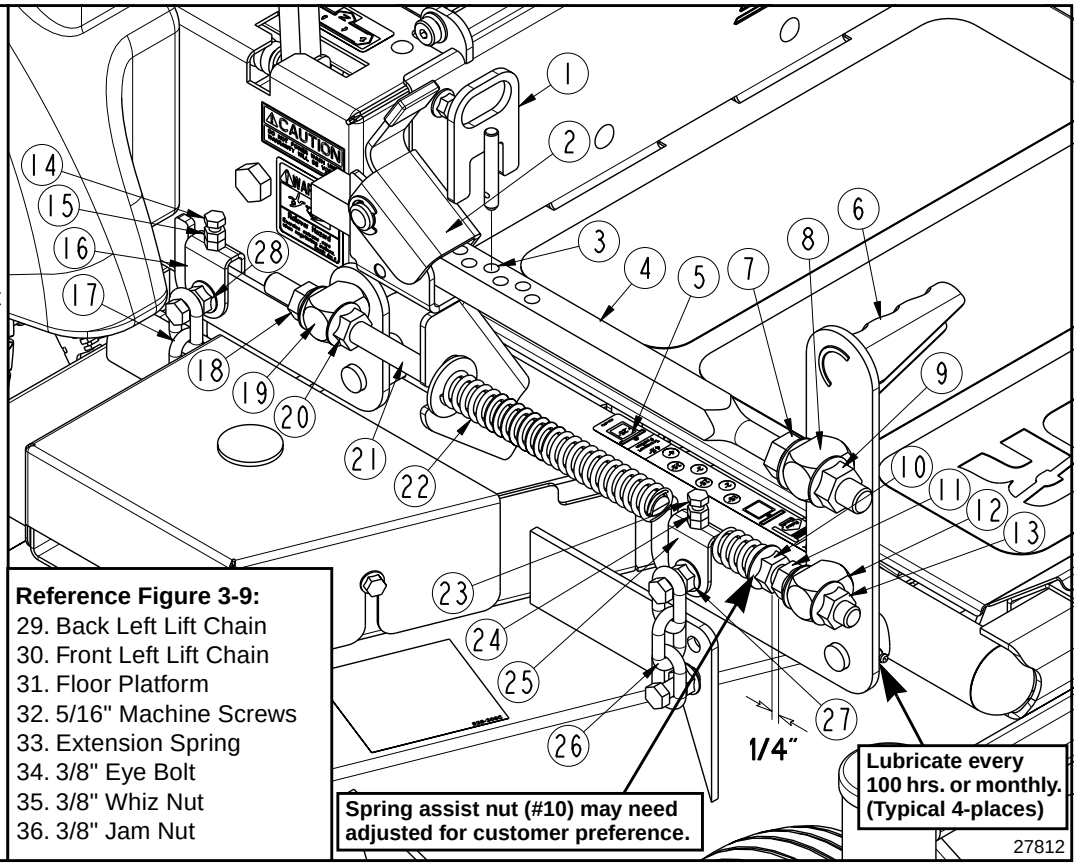
a. Adjust flange nut (#18) against spring assist trunnion (#19) until lift chain (#29) on the back left side is tight and the deck is still resting on the support blocks.
b. After flange nut (#18) has been properly adjusted, tighten flange nut (#20) to the proper torque.

Back Right Lift Chain #17

a. Make sure adjuster yoke (#16) moves freely.
b. Tighten adjuster screw (#14) until lift chain (#17) on the back right side is tight and the deck is resting on the support blocks.
c. Tighten adjuster jam nut (#15) & yoke nuts (#28).

12. Raise deck fully up until stop handle (#2) catches on the cross notch in the deck height gauge bar (#4).
13. Remove support blocks from under the deck.

1. Deck Stop
2. Stop Handle
3. Deck Stop Hole
4. Deck Height Gauge Bar
5. Deck Height Indicator
6. Deck Lift Pedal
7. 3/4" Flange Nut
8. Deck Lift Trunnion
9. 3/4" Flange Nut
10. Spring Assist Flange Nut
11. 5/8" Flange Nut
12. Spring Assist Trunnion
13. 5/8" Flange Nut
14. Adjuster Screw
15. Adjuster Jam Nut
16. Adjuster yoke
17. Back Right Lift Chain
18. 5/8" Flange Nut
19. Spring Assist Trunnion
20. 5/8" Flange Nut
21. Deck Lift Rod
22. Compression Spring
23. Adjuster Screw
24. Adjuster Jam Nut
25. Adjuster Yoke
26. Front Right Lift Chain
27. 7/16" Hex Whiz Nut
28. 7/16" Hex Whiz Nut


CAUTION
1/4"
Spring assist nut (#10) may need adjusted for customer preference.
Lubricate every 100 hrs. or monthly. (Typical 4-places)
27812

Reference Figure 3-9:
29. Back Left Lift Chain
30. Front Left Lift Chain
31. Floor Platform
32. 5/16" Machine Screws
33. Extension Spring
34. 3/8" Eye Bolt
35. 3/8" Whiz Nut
36. 3/8" Jam Nut

Deck Adjustment (Right Side Shown)
Figure 3-8

Deck Lift Assist Springs

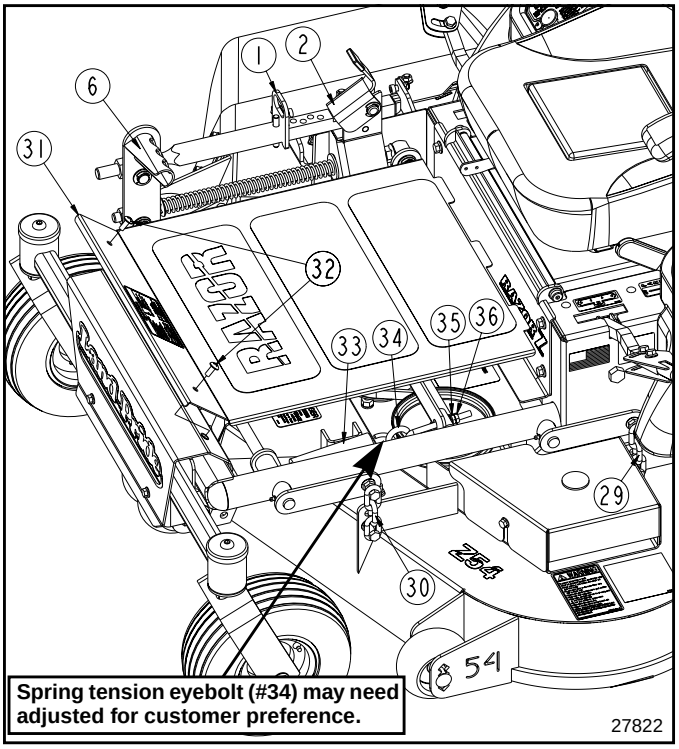
Refer to Figure 3-8:

There are two deck lift assist springs. The right side deck lift compression spring (#22) is factory set with 1/4" space between spring assist flange nut (#10) and flange nut (#11). Spring assist flange nut may require adjustment for customer preference.

Refer to Figure 3-9:

The left side deck lift extension spring (#33) is located under the floor platform (#31) and will require readjustment if the operator cannot easily press down on the deck lift pedal (#6) or if the deck weight won't hold deck stop (#1) against stop handle (#2) while traveling.

1. Lower deck to its lowest mowing position to ensure deck is still tight against the stop handle when the assist spring is in its tightest position.
2. Remove screws (#32) and floor platform (#31).
3. Back jam nut (#36) away from adjusting nut (#35).
4. Turn adjusting nut (#35) clockwise to increase spring tension and to make lifting the deck easier. Turn adjusting nut (#35) counterclockwise to decrease springs tension and to increase deck weight against the stop handle.
5. After adjusting nut (#35) has been properly adjusted, tighten jam nut (#36) against the adjusting nut.
6. Replace floor platform (#31) & tighten screws (#32).



Deck Adjustment (Left Side Shown)
Figure 3-9

Anti-Scalp Rollers

Refer to Figure 3-10:

On the front of the mower deck are four anti-scalp rollers (#6). Their purpose is to minimize scalping the ground when mowing on rough uneven terrain. Their height should be adjusted after setting the deck stop to the preferred cutting height.

1. Position mower and deck on a flat level surface.
2. Set deck to the preferred mowing height. (Refer to **"Cutting Height Settings"** on this page.)
3. Remove 1/2" hex nylock jam nuts (#4) from all four anti-scalp rollers (#6).
4. Reposition anti-scalp rollers up or down in the roller mounting notches (A) with carriage bolts (#2 & #3) as shown. See important note below.

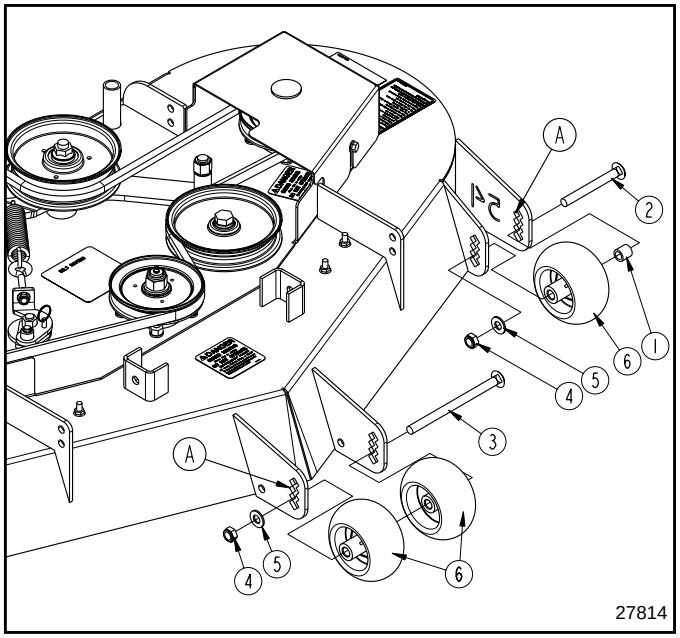
IMPORTANT: The anti-scalp rollers will extend below blade cutting height the distance shown below when mounted in the following holes:

- 1/4" below if mounted in the top notches.
- 3/4" below if mounted in the 2nd notches.
- 1 1/4" below if mounted in the 3rd notches.
- 1 3/4" below if mounted in the bottom notches.

For protection of deck and blades, it is best if the rollers are mounted in the lowest possible notches without rollers touching the ground.

For example:
If deck cutting height is set at 1", the rollers should be mounted in the 2nd notches down from the top.

5. Secure anti-scalp rollers to the mounting brackets with flat washers (#5) and 1/2"-13 hex nylock nuts (#4). Tighten nuts to the correct torque.



Anti-Scalp Roller Adjustment
Figure 3-10

Cutting Height Settings

Refer to Figure 3-8:

Cutting height is adjustable from 1.5" to 4.5" in 1/4" increments. The holes in the deck height gauge bar (#4) are spaced at 1/2" intervals. By turning the deck stop (#1) around, 1/4" increments can be attained due to the 1/4" plate thickness that is part of the stop.

EXAMPLES:

1. When deck stop (#1) is placed in one of the holes with the 1/4" plate facing forward, the cutting height will be the same as indicated on the deck height indicator:
   1 1/2, 2, 2 1/2, 3, 3 1/2, 4, or 4 1/2" (transport position).
2. When deck stop (#1) is placed in one of the holes, with the 1/4" plate facing rearward (against stop handle (#2), the cutting height will be 1/4" more than the deck height indicator:
   1 3/4, 2 1/4, 2 3/4, 3 1/4, 3 3/4, 4 1/4", or
   4 1/2" (Transport Position).

The notch located at the rear of the deck height gauge bar (#4) is used when placing the deck in transport position.

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Maintenance

Regular scheduled maintenance is the best prevention for costly downtime and expensive, premature repair. Correct problems as quickly as possible. The following pages contain suggested maintenance information and schedules to follow routinely.

Check initially and periodically for loose bolts and pins. Torque loose bolts per the **"Torque Values Chart"** on page 79. Remain alert for unusual noises, they could be signaling a problem. Visually inspect machine for any abnormal wear or damage. A good time to detect potential problems is while performing scheduled maintenance. Correcting problems as quickly as possible is the best insurance.

Clear away heavy build-up of grease, oil, and dirt, especially around the engine and under the seat platform. Minute dust particles are abrasive to close-tolerance engines and hydraulic assemblies.

Inspect mower daily for grass clippings, tangled wire and string. The underside of the mower deck will collect a build-up of grass clippings and dirt, especially when grass is wet or has high moisture content. This build-up will harden, restricting blade and air movement and will usually produce a poor quality of cutting. Therefore, debris should be routinely removed from under the deck. To do this, it will be necessary to raise and block the deck in the full up position before scrapping build-up from underneath.

Some repairs require the assistance of a trained service mechanic and should not be attempted by unskilled personnel. Consult your Land Pride dealer when assistance is needed.

Maintenance Safety

DANGER

Repairs or maintenance specifically requiring engine power should be performed by trained personnel only. Control levers should be out. If control levers are to be operated, the tires should be properly supported off the floor. Enclosed areas should be properly ventilated to prevent carbon monoxide poisoning.

DANGER

Before working on or under the deck, make certain blade engagement switch has been shut off, deck has been properly blocked up, engine has been shut off and ignition switch key has been removed for maximum safety.

Repairs or maintenance requiring engine power should be performed by trained personnel only.

DANGER

Exercise caution when working under the deck as the mower cutting blades are extremely sharp. Wearing gloves is advisable when working around or with cutting blades.

WARNING

Read and observe all safety warnings in this manual and in the engine service manual.

WARNING

Except when checking or changing components, always keep protective shields on for safety as well as for cleanliness.

WARNING

Keep your machine clean. Remove all deposits of trash and clippings. A dirty machine can cause engine fires and hydraulic overheating as well as excessive belt wear.

WARNING

DO NOT have engine running when servicing or making adjustments to the mower. Shut blade engagement switch off, move both control levers out, set park brake on, shut engine off and remove ignition switch key.

WARNING

When possible, clean under the deck using a stick or similar instrument making sure that no part of the body, especially arms and hands are under the mower.

WARNING

Keep mower properly maintained. Do not make unauthorized modifications. An improperly maintained mower or one that has been improperly modified can be dangerous to operate.

WARNING

Do not operate mower with loose pins, bolts, and nuts. Loose hardware can result in a serious breakdown causing bodily injury or death.

Maintenance Schedule

Service at Intervals Indicated	Every 25 Hrs	Every 50 Hrs	Every 100 Hrs	Every 200 Hrs	Every 500 Hrs	Refer to Page
Clean mower, Deck & Engine Cooling System	Daily (After engine has cooled.)					
Verify Safety Start Interlock System	Daily (Before each use)					See Operator's Manual
Inspect Unit for loose hardware and damage	Daily (Before each use)					54
Visually Inspect Tires	Daily (Before each use)					79
Check Engine Oil Level	Daily (Before each use & every 4 hours thereafter)					68
Clean Air Intake Screen	Daily (Before each use & every 4 hours thereafter)					69
Check Fuel Level	Daily (Before each use)					62
Inspect Fuel System for Leaks	Daily (Before each use)					62
Check Blades - Sharp & Securely Fastened	Daily (Before each use)					66 & 79
Check Discharge Chute - Make sure it is Properly Secured In Place	Daily (Before each use)					
Grease Blade Spindle Bearings	X					72
Change Engine Oil & Filter (1)		X				68
Clean Cylinder And Head Fins		X				
Check Battery Connections		X				59
Check Tire Pressure With A Gauge		X				79
Clean Engine Exterior (3)		X				
Check hydraulic Oil Level		X				60
Tighten Lug Nuts On Wheels (2)		X				79
Grease Caster Wheel Bearings			X			72
Check Ground And Deck Belt Tension (4)			X			64
Check Hydraulic system (5)			X			62
Change Fuel Filter (3)			X			63
Grease Deck Lift Points (8)			X/M			73
Grease Deck Lift Pivot Points (8)			X/M			73
Replace Spark Plugs(3)				X		
Replace Air Cleaner Paper Element (6)				X		69
Inspect tethered fuel caps (8)					X/A	63
Change Hydraulic Oil & Filter (7) (8)					X/A	60

NOTES:

1. Initial engine oil and oil filter change is after the first 5 hours of operation. Thereafter, change engine oil and oil filter every 50 hours of operation. Change every 25 hours when operating the engine under dusty or dirty conditions, heavy load, high temperatures, and hot weather periods. Refer to Engine Owner's Manual.
2. Torque lug nuts initially and after first 2 hours of operation.
3. Remove cooling shrouds and clean cooling areas. Check oil cooler fins and clean as needed. Refer to Engine Owner's Manual.
4. Inspect ground and deck belt tensions every 6 months or 100 hours and replace if worn or cracking is noticed. Otherwise, replace every 200 hours or 2 years whichever comes first.
5. Inspect all hydraulic system components for leaks and repair as necessary. Replace any hoses that are cracked or damaged.
6. Replace air cleaner filter element if damaged, every 200 hours or every season (whichever comes first). Replace more frequently when used in dusty conditions.
7. Initial hydraulic oil and filter change is between 25 and 50 hours of operation.
8. X/M = Service per hours indicated in column or monthly (whichever comes first).
   X/A = Service per hours indicated in column or annually (whichever comes first).

Maintenance Locations

Your ZSR Zero Turn Mower is designed with innovative state-of -the art components that should be maintained. Knowing the location and how to maintain these components is the best prevention for costly downtime or expensive, premature repair. Become familiar with the components listed below. Most are reviewed in **"Section 8: Adjustments"** and this section.

Refer to Figure 5-1:

1. Pulley Guards (Guards removed for clarity)
2. Over-Center Belt Tensioner
3. Eye bolt
4. Deck Belt Tensioner Spring
5. Deck Tension Idler
6. Blade Spindle Zerks (3)
   (1) Under floor platform
   (2) Through opening in pulley guards
7. Belt Pulleys
8. Electric Clutch
9. Deck Belt
10. Anti-Scalp Wheels
11. Discharge Chute

Refer to Figure 5-2:

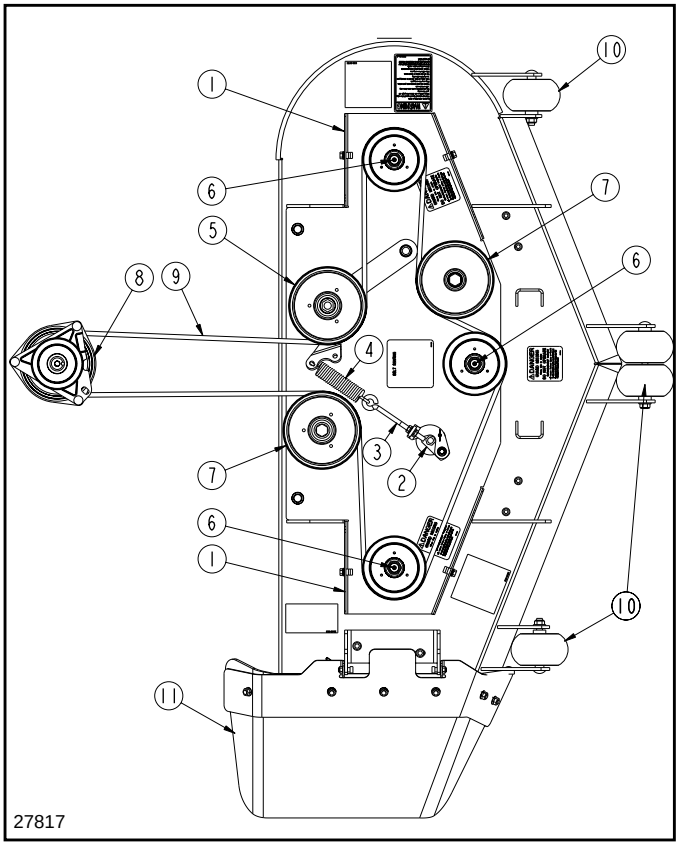
12. Blade Bolt
13. Blade Washer
14. Cutting Blades
15. Deck Underside

Refer to Figure 5-3:

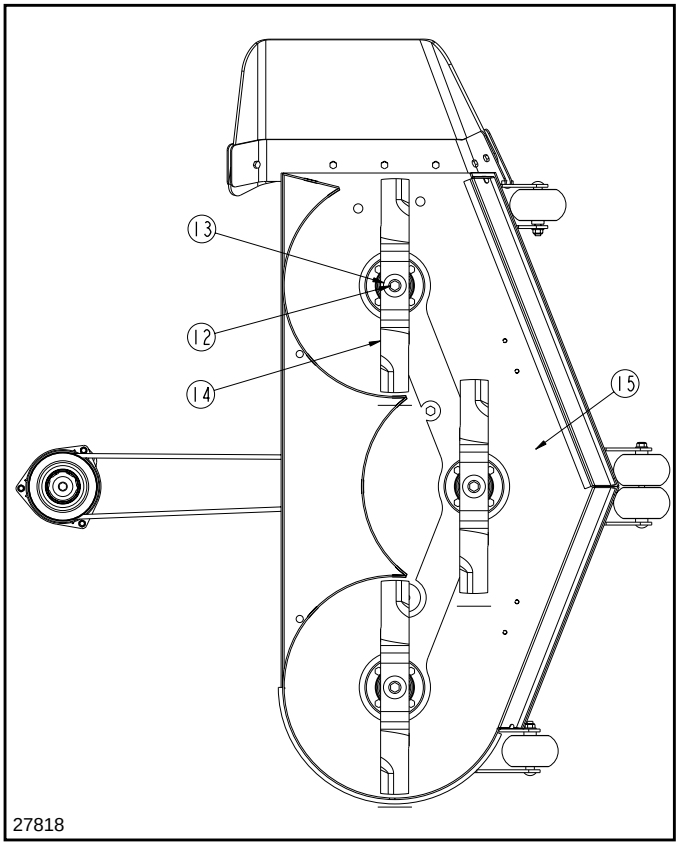
16. Engine Oil Fill & Dipstick (Kawasaki: RH side) (Briggs & Stratton: LH side)
17. Engine Oil Drain Plug (Under oil fill & dipstick.)
18. Engine Oil Filter
19. Engine Air Cleaner
20. Fuel Filter (Location varies by engine)
21. Seat Release Latch (Not visible. Located on rear of seat.)
22. Hydraulic Oil Expansion Tank (2) (For level check and adding oil.)
23. Battery (located under seat)
24. Operator Pressure Switch (Located under seat.)
25. Park Brake
26. Floor Platform
27. Left/Right Fuel Tank Valve (Below right arm rest)
28. Seat Adjustment Latch
29. Axle Pivot Locking Pins
30. Fuel Tanks (2)
31. Full Tank Caps (2)
32. Blade Spindle Zerk Access Hole

Refer to Figure 5-4:

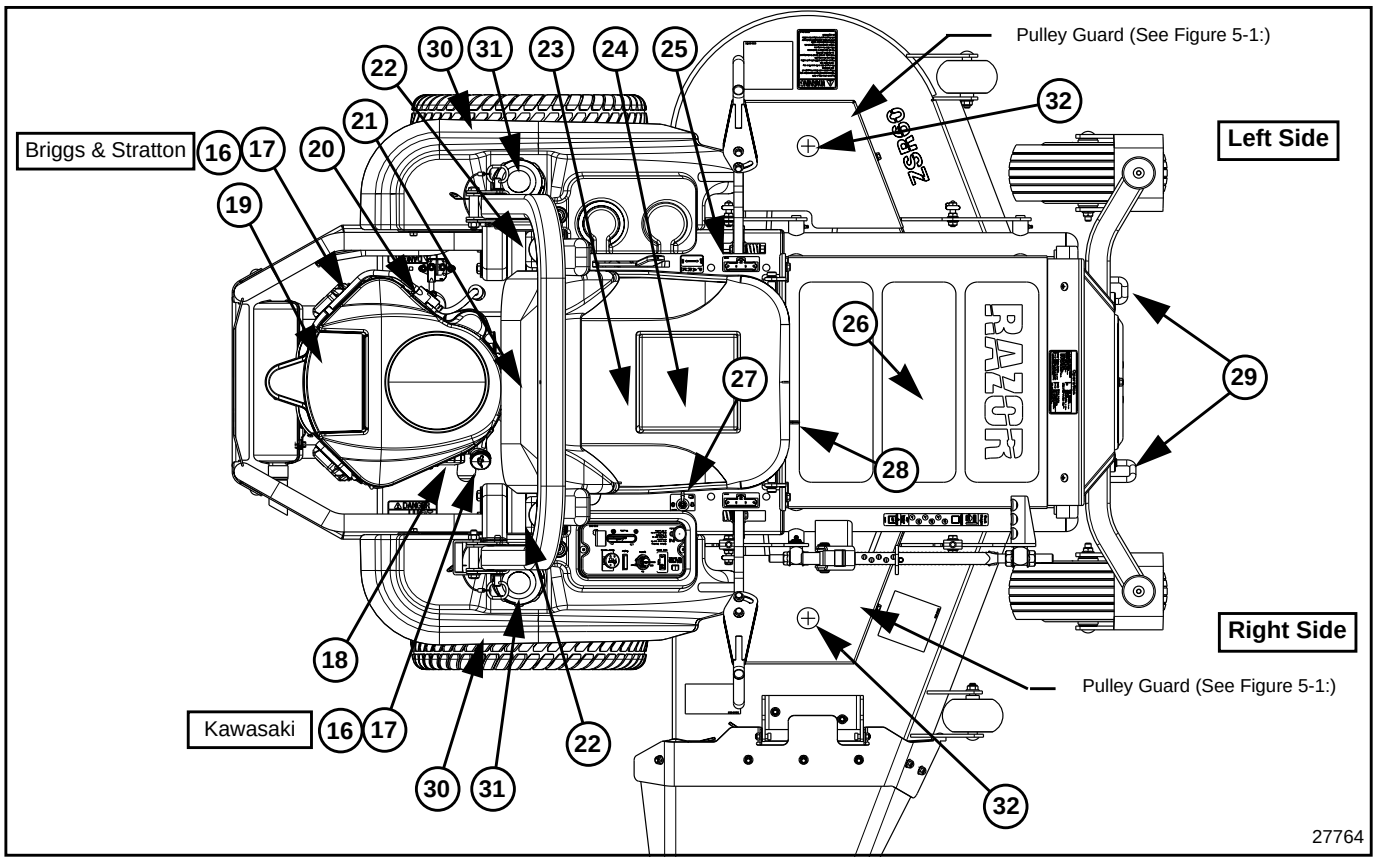
33. Engine Muffler
34. Electric Clutch & Pulleys
35. Ground Drive Belt
36. Ground Belt Take-Up Arm
37. Ground Belt Tension Idler
38. Hydraulic Oil Filters (2)
39. Drive Wheels (2)
40. Deck Lift Grease Zerks (4)
41. Caster Wheel Grease Zerks (2)
42. Caster Wheels (2)
43. Deck Lift Pivot Grease Zerks (2)
44. Electric Clutch Bolt



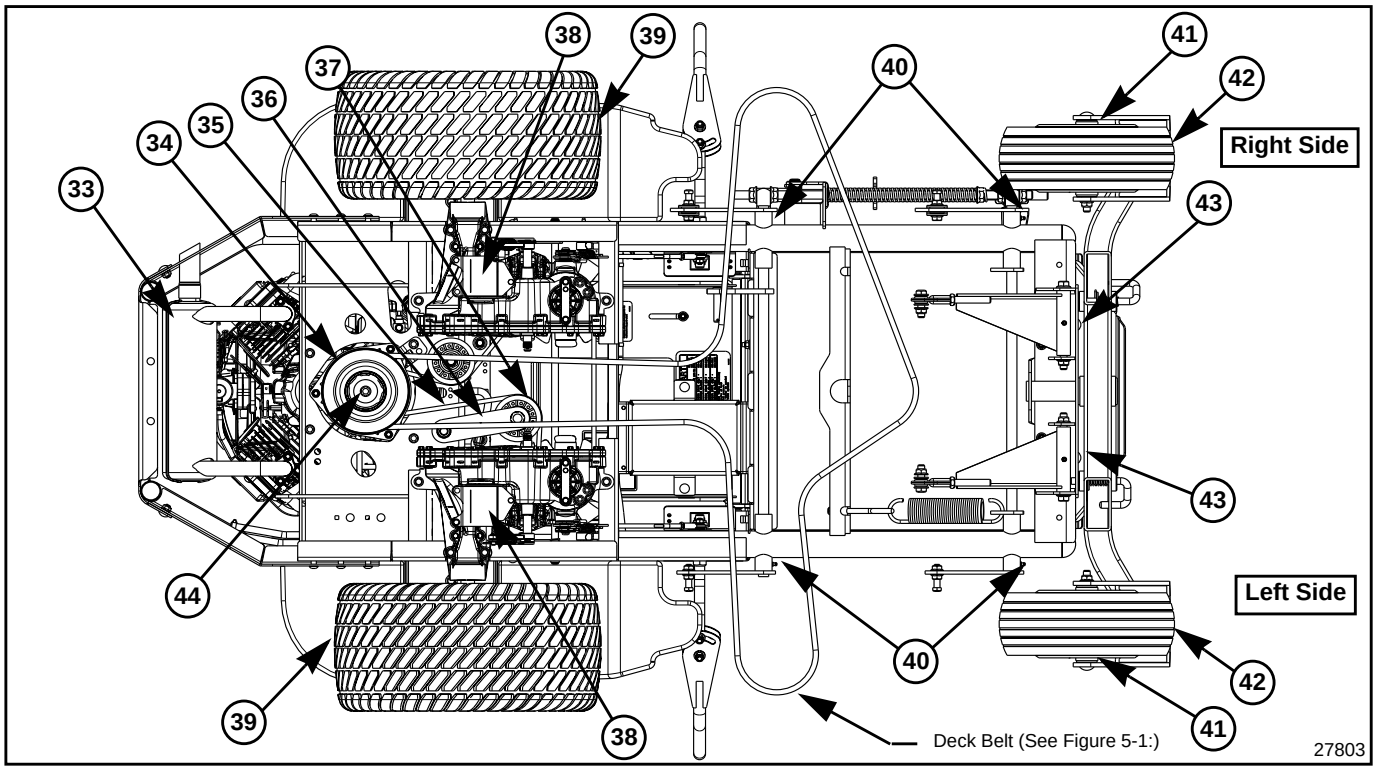
Top View of Deck
Figure 5-1



Bottom view of Deck
Figure 5-2



Top View of Mower (Kawasaki Engine Shown)
Figure 5-3



Bottom view of Mower (Deck Not Shown)
Figure 5-4

Torque Requirements

Refer to **"Torque Values Chart"** on page 79 to determine correct torque values when tightening hardware. See **"Additional Torque Values"** at the bottom of the chart for exceptions to standard torque values.

WARNING

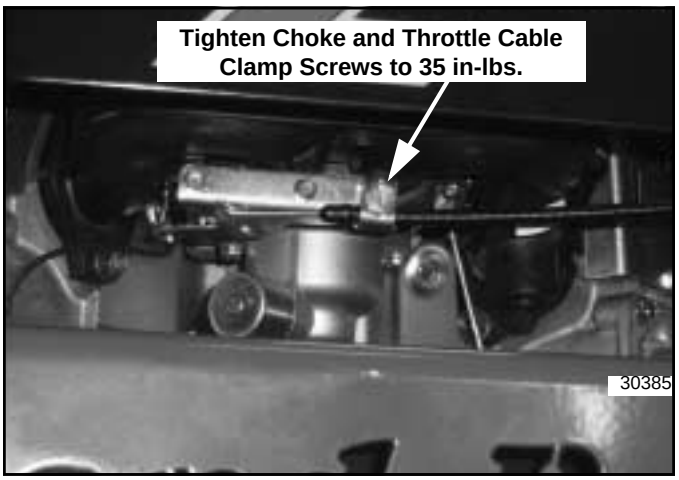
Particular attention must be given to tightening the drive wheel lug nuts, blade spindle bolts, electric clutch bolt and transaxle mounting bolts and nuts. Not torquing these components correctly can result in the loss of a wheel, blade or burnt clutch. Any of the above situations can cause serious damage to the equipment and/or personal injury.

It is recommended that the following be checked after the first 2 hours of initial operation and after removal for repair or replacement. Thereafter, they should be checked every 50 hours of operation.

- Blade bolts (See item (#12) in Figure 5-2 on page 56)
- Electric Clutch bolt (See item (#44) in Figure 5-4 on page 57)
- Wheel lug nuts (See item (#13) in Figure 5-16 on page 65)
- Transaxle mounting bolts (See item (#12) in Figure 5-16 on page 65)

Refer to Figure 5-5:

- Retighten choke and/or throttle cable clamp screws to 35 in-lbs if they work loose or are loosened to make cable adjustments.
- See engine owner's manual for all other engine torque values.



Choke and Throttle Cable Clamp Screws
Figure 5-5

Tires

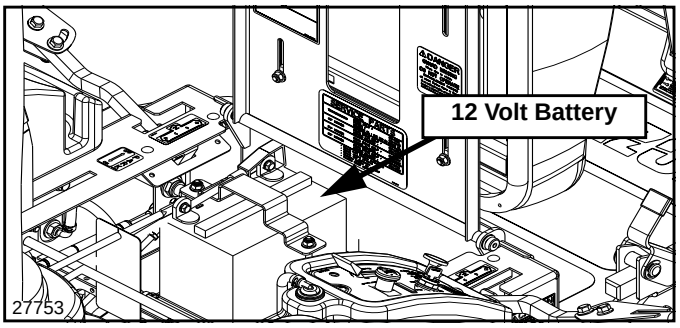
IMPORTANT: Use only tires recommended by Land Pride. Solid fill tires are not to be used on Zero Turn Mowers.

It is important for your safety and the safety of others that the tires have correct air pressure. Check air pressure in all four tires before each use. Visually inspect tires for loss of air throughout each day of operation. See **"Tire Inflation Chart"** on page 79 for correct tire pressure.

Electrical System

Refer to Figure 5-6:

The mower is equipped with a 12 volt negative ground electrical system powered by a battery located under the seat. When worn out, replace it with a maintenance-free garden mower 12 volt BCI group UL1HD with 245 cold cranking AMPs (CCA) or U1L-X with 300 CCA. Follow manufacturer's maintenance, safety, storing, and charging specifications.



Battery
Figure 5-6

WARNING

Incorrect battery cable connections can damage the mower's electrical system and cause battery cables to spark. Sparks around a battery can result in a battery gas explosion and personal injury.

- *Always disconnect negative (black) cable from battery before disconnecting positive (red) cable.*
- *Always reconnect positive (red) cable to the battery's positive (+) post before reconnecting negative (black) cable to the battery's negative (-) post.*

WARNING

Keep battery terminals from touching any metal mower parts when removing or installing battery. Do not allow metal tools to short between battery terminals and metal mower parts. Shorts caused by battery terminals or metal tools touching metal mower components can cause sparks. Sparks can cause a battery gas explosion which can result in personal injury.

WARNING

Acid can cause serious injury to skin and eyes. Avoid skin contact with battery acid and always wear eye protection when checking the battery. Flush area with clean water and call a physician immediately. Acid will also damage clothing.

WARNING

Do not overfill battery. Electrolytes may overflow and damage paint, wiring and structure. Use soap and water when cleaning the battery. Be careful not to get soap and water into the battery. Use soda mixed in water to clean corrosion off the terminals.

WARNING

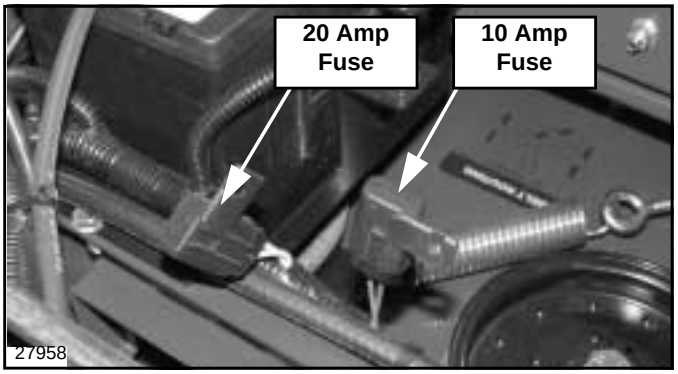
Do not allow an open flame near the battery when charging. Hydrogen gas forms inside the battery. This gas is both toxic and flammable and may cause an explosion if exposed to a flame.

Common circuit problems are usually caused by electrical shorts, corroded, or dirty terminals, loose connections, defective wire insulation, or broken wires. Switches, solenoids, and ignition components may also fail, causing a shorted or open circuit.

Refer to Figure 5-7:

The electrical system is protected by fuses located along the wire harness beneath the seat.
The fuses are:

- Main - 20 Amp, blade type
- Clutch - 10 Amp, blade type



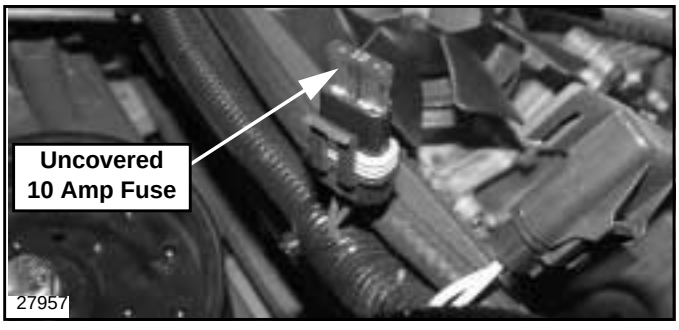
Wiring Harness Fuses
Figure 5-7

Refer to Figure 5-8:

Remove cover over the fuse to access the fuse.

Before diagnosing the electrical system, use a test light or voltmeter to check battery voltage. If battery voltage is satisfactory, check cleanliness and tightness of terminals and ground connections. A general understanding of electrical servicing and use of basic test equipment is necessary for troubleshooting and repair.

Major overhaul or repair of starting motor and charging system should be performed by trained technicians only.



10 AMP Fuse Shown W/Cover Removed
Figure 5-8

Hydrostatic Drive System

DANGER

Hydraulic fluid under pressure can penetrate skin. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Use a piece of cardboard or wood rather than hands when searching for hydraulic leaks. If hydraulic fluid is injected into the skin, it must be treated by a doctor within a few hours or gangrene may result.

WARNING

Always wear adequate eye protection when servicing the hydraulic system.

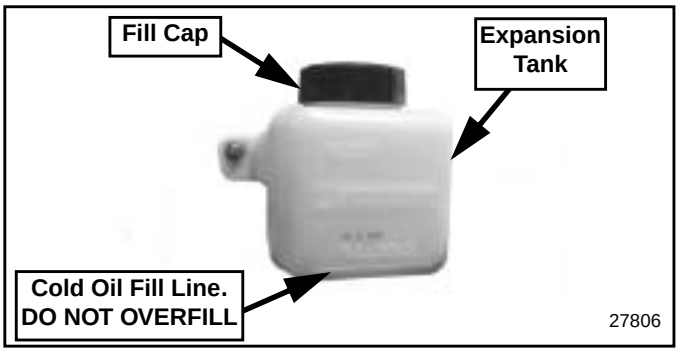
IMPORTANT: Do not use a high pressure washer on or around the hydraulic transaxles. Water intrusion will result and void the warranty.

The Z Series are equipped with Hydro-Gear ZT-2800™ & ZSR Series are equipped with Hydro-Gear ZT-3100™ Integrated Zero-Turn Transaxle units. The units are located beneath the seat. These units are self contained and maintenance free except for changing oil and filters.

NOTE: Make certain to place the control arms in the park position before rotating the seat platform up.

IMPORTANT: Repairs to a transaxle unit should be performed by trained technicians only.

NOTE: The transaxle units are equipped with bypass valves for the purpose of moving the mower when engine is inoperable.



Hydraulic Reservoir
Figure 5-9

Hydraulic Oil Level Check

Refer to Figure 5-9:

Hot oil expands, therefore, check hydraulic oil level only when it is cold. The left side is independent from the right side. Make sure you check and fill oil as needed on both sides. Oil level should be about 1/8" deep in the bottom of expansion tank when cold. Add hydraulic oil to the tank if no oil is present. **Do not overfill**. See page 76 for hydraulic oil specifications.

Transaxle Oil and Filter Change

The mower has two independent hydrostatic transaxle systems. Each system will require separate oil and oil filter changes. It is best to change oil soon after using the mower while dirt particles are still suspended in the oil. See page 76 for transaxle oil specifications.

Initially, change oil and oil filters after the first 25 to 50 hours of operation. Thereafter, change oil and filters every 200 hours or every year whichever comes first. Two filters are required with each oil change. They may be purchased from your nearest Land Pride dealer. See page 76 for filter part numbers.

IMPORTANT: The transaxles must be purged after every oil change. See**"Transaxle Purging Procedures"** on page 61.

IMPORTANT: Refer to Figure 5-10 & Figure 5-11 on page 61. Clean debri from around the oil filter (#4), top port plug (#9), and expansion tank cap (#12) before draining any oil.

1. Park unit on a flat level surface. Stop engine and remove ignition key. Make sure blade engagement switch is **in the down (OFF) position.** Spread control levers fully apart.

Refer to Figure 5-10 & Figure 5-11 on page 61:

2. Begin on the left side by placing an oil pan (12" or more in diameter with approximately 8 qt. capacity) beneath the transaxle oil filter (#2).
3. Remove screws (#3) and filter guard (#1).
4. Clean transaxle exterior and expansion tank of any debris. A degreaser may be needed.

NOTE: Drain old oil filters of all free flowing oil prior to disposal. Place used oil and oil filter in appropriate containers and deliver to an approved collection facility.

5. Unscrew the used oil filter (#2). Be sure to properly dispose of filter.
6. Remove expansion tank cap (#7) to facilitate drainage.
7. Allow oil to drain until it has slowed to a slow drip. Be sure to properly dispose the oil.
8. After oil has completely drained, install a new oil filter per instructions below:
   a. With a clean rag, clean the mounting surface that the filter seats against.
   b. Apply a thin coat of oil on the rubber seal surface of the new filter (#2).
   c. Screw filter on until it makes contact with the surface it seats against.
   d. Tighten filter an additional 3/4 to 1 full turn more.
   e. Install filter guard (#1) with three 1/4" screws (#8). Torque screws to 65 in-lbs.

9. Remove top port plug (#4). This will allow the transaxles to vent during oil fill.
10. Fill transaxle with oil by adding oil to the expansion tank (#7) until oil appears at the top port opening (approximately 2 qts.). See page 76 for transaxle oil specifications.
11. Install top port plug (#4) and tighten to 180 in-lbs.
12. Continue to add oil to the expansion tank until oil reaches the full cold line (approximately 1/2" up from the bottom of the tank).

NOTE: The fill tube (#5) should be hand squeezed several times to burp out air and to drain oil from the expansion tank into the tube. Be careful not to damage the tube while squeezing it. Use a protective cloth wrapped around the tube if using a tool to squeeze such as a pair of pliers.

13. Reinstall expansion tank cap (#7) by hand. Be careful to not overtighten.
14. Wipe off all excess oil. A degreaser may be needed to remove excess oil.
15. Repeat steps 1 thru 14 for the right side.

Transaxle Purging Procedures

It is critical that air is purged from the hydrostatic drive system to keep it efficient. This is because compression and expansion rate of air is higher than that of oil.

This purge procedure should be implemented any time the hydrostatic system has been opened to facilitate maintenance or after the oil has been changed.

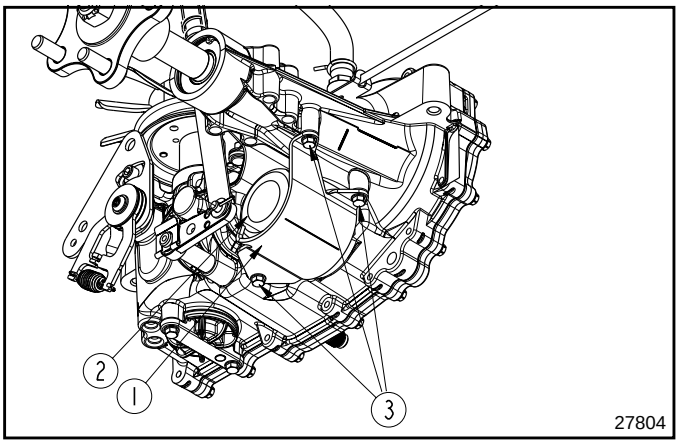
Symptoms of a hydrostatic system that has not been purged may be:

1. Noisy operation.
2. Lack of power after short term operation.
3. High operation temperature and excessive expansion of oil.

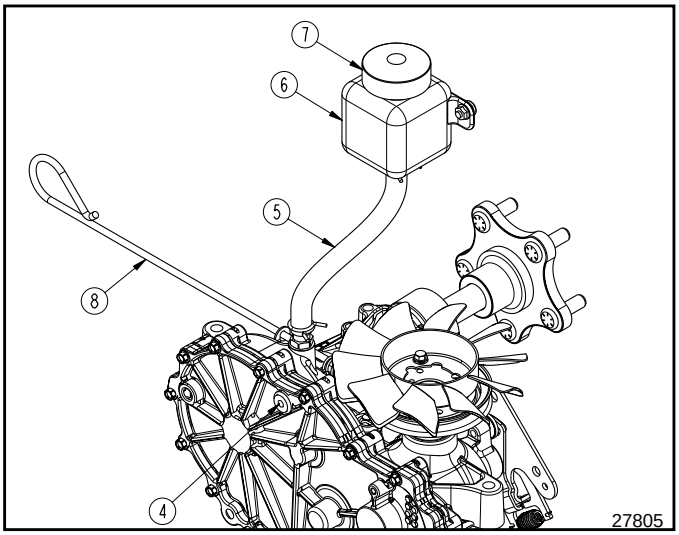
Refer to Figure 5-11:

Before purging system, make sure fill tubes (#10) are full of oil and expansion tanks (#11) are filled to the cold full line. Squeeze all air from fill tubes and add oil if expansion tanks are low. See page 76 for transaxle oil specifications. The following procedures are best performed with mower drive wheels off the ground and then repeated under normal operating conditions. If this is not possible, the procedure should be performed in an open area free of any objects or bystanders.

1. Open both transaxle bypass valves by pulling out on the bypass valve rods (#13) and lifting them into the slot to lock them in position. Bypass valve rods are located at the rear of the engine platform.



Left Transaxle (View of Oil Filter)
Figure 5-10



Left Transaxle (Inboard View)
Figure 5-11

2. Start the engine and place both control levers in neutral. Slowly move the control levers completely forward and reverse 5 to 6 times.
3. Close both bypass valves by pulling back on the rods, lowering them down and slowly releasing them to allow the springs to pull back on the rods.
4. With engine running and control levers in neutral, slowly move levers forward and reverse 5 to 6 times.
5. Stop engine and check fill tubes (#10) and expansion tanks (#11). Squeeze all air from fill tubes and add oil if expansion tanks are low.

IMPORTANT: The transaxle is considered purged when transaxles are at the proper oil level, operate at normal noise levels, oil temperatures are not excessive high and mower does not lack in power.

6. It may be necessary to repeat Steps 1 to 5 until all air is completely purged from the system and the transaxle operates at normal noise levels and travels at normal speeds.

Fuel System

Refer to Figure 5-12:

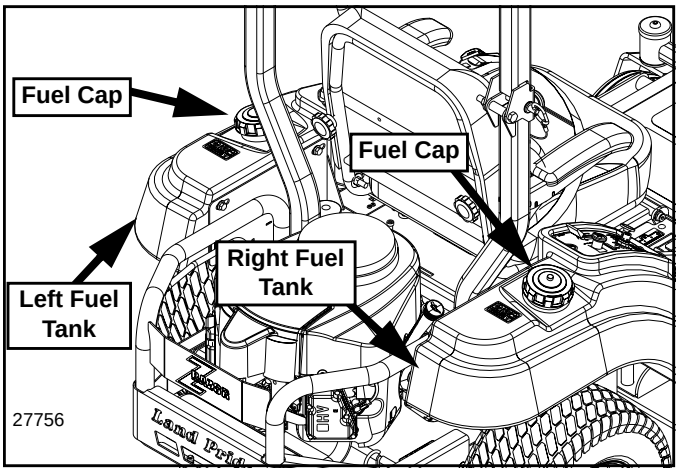
The fuel tanks are located on the mower's fenders. Total capacity of the fuel tanks is 12 U.S. gallons. Before filling, push blade engagement switch **(OFF)**, move both control levers **(OUT)**, set park brake **(ON)**, and turn switch key **(OFF)**. Allow engine to cool before filling tanks.

Allow engine to cool before filling tanks. Clean dirt from around fuel tank cap. Remove cap and begin filling. Do not fill fuel tanks to the top. Fuel will expand in hot weather and seep out through the fuel tank vent system. When finished, screw cap back on tight. EPA compliant caps will make a clicking noise and ratchet action that can be heard and felt when tight. Wipe up any spilled gasoline. Use regular unleaded gasoline with an (R+M)/2 octane rating of 87 or higher.

IMPORTANT: The fuel system can be damaged if the wrong fuel is used. Never use methanol, lead gasoline or unleaded gasoline containing more than 10% ethanol. Do not mix oil with gasoline.

Land Pride recommends adding correct amounts of gas stabilizer/conditioner in the fuel. For best results, follow engine manufacturer's directions. Using a fuel stabilizer/conditioner in the fuel can provide benefits such as:

1. Keeps gasoline fresh during storage of 90 days or less. Drain fuel tanks if storage is longer.
2. Cleans engine during operation.
3. Eliminates gum-like varnish build-up in the fuel system.



Left & Right Fuel Tanks
Figure 5-12

DANGER

- *Replacement of fuel system parts (i.e. gas caps, hoses, fuel tanks, fuel filters, etc.) must be the same as original parts. Fire and/or explosion can occur if not followed.*
- *Observe safe fuel handling precautions. Fuel is flammable and vapors are very explosive. An explosion or fire can burn, destroy and kill property, animals and people.*
- *Do not fill tank with engine running or while engine is hot. Allow engine to cool before filling. Fuel spilled over engine, muffler, or hot objects may result in a fire or explosion.*
- *Allow engine to cool before servicing the fuel system.*
- *Do not smoke while handling fuel or around the fuel tanks.*
- *Do not fill fuel tanks to the top. Fuel will expand in hot weather and seep out through the fuel tank vent system.*
- *Screw gas cap on immediately after filling a tank. Never operate mower without gas caps installed.*
- *Clean up any gasoline spills immediately.*
- *Keep fuel away from open flame or spark.*
- *Store mower away from open flame and sparks.*
- *Refuel outdoors preferably, or in well ventilated areas.*
- *Never attempt to start the engine when there is a strong odor of gasoline fumes present. Locate and correct cause.*
- *Never buy more than a 30 day supply of gasoline and store it in an approved container out of children's reach.*
- *Do not fill gasoline containers inside a vehicle, on a truck, or on a trailer. Interior carpets and plastic truck bed liners insulate the container and slow loss of static charge.*
- *When practical, remove equipment from the truck or trailer and refuel the equipment with its wheels on the ground. If this is not possible, then refuel the equipment on the truck or trailer using a portable container and not a gasoline dispenser nozzle. If a gasoline dispenser nozzle must be used, keep nozzle in contact with rim of fuel tank or container opening at all times until fueling is complete.*
- *Gasoline is a poison that is harmful or fatal if swallowed.*
- *Avoid prolonged breathing of vapors. Long-term exposure to vapors can cause serious injury and illness.*
- *Keep face away from nozzle and gas tank opening.*
- *Keep gas away from eyes and skin.*

Evaporative Emission Control System

All Land Pride Zero Turn Mowers will be EPA compliant on the required January 1, 2012 date. Mowers that are EPA compliant now have a decal on them stating: “This Equipment meets U.S. EPA Evap. Standards|”. The Evaporative Emission Control System requires no regularly scheduled maintenance but should be inspected periodically, and thoroughly examined at least once a year at the beginning of the mowing season:

1. Inspect all fuel system components including tanks, vents, hoses, clamps, fuel filter, valves, and fittings for leaks, cracks, and loose connections. Make repairs as necessary.
2. The fuel tanks are equipped with tethered caps Ensure tether is present and secured to the cap.
3. The fuel caps have been designed to provide audible and tactile feedback indicating that proper sealing has been achieved. Ensure that this function is present and that no fuel leaks from the filler neck during usage. If fuel leakage is ever noticed at this point, the fuel cap must be replaced immediately.

Fuel Filter

Refer to Figure 5-22 on page 68:

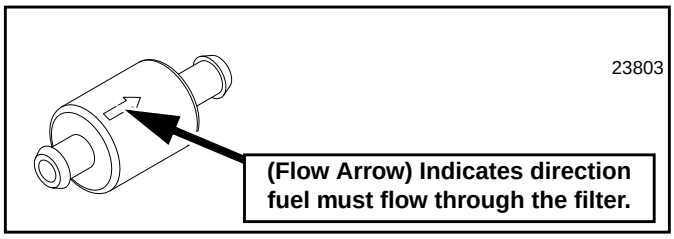
DANGER

Empty fuel tank before replacing fuel filter to keep fuel from leaking out and creating a fire/explosion hazard.

The fuel filter is installed in the fuel line between the Left/Right Fuel Tank Valve and engine fuel pump. Location of fuel filter will vary depending on which engine your mower is equipped with. See engine owner’s manuals for exact location of fuel filter and instructions on removal and installation.

Refer to Figure 5-13:

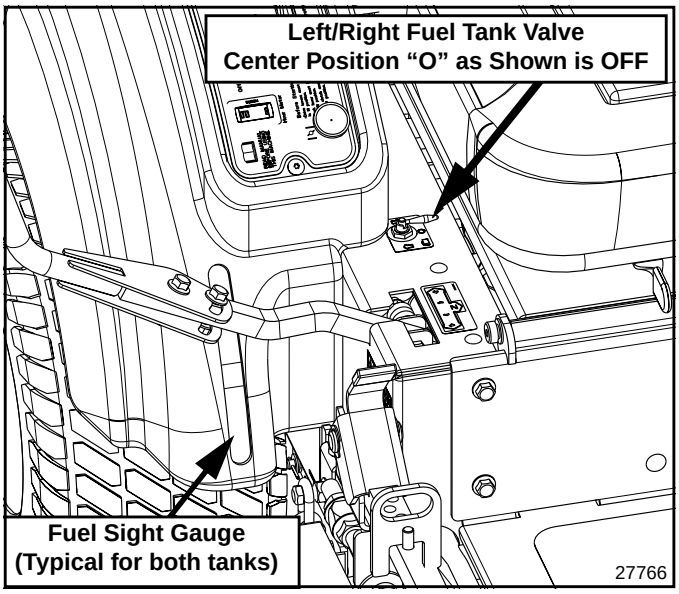
Replace fuel filter annually at the beginning of each mowing season or after every 100 hours of operation, whichever occurs first. (Plugged filter considered maintenance item) This will keep the fuel filter from becoming plugged causing poor engine performance and unexpected downtime. Be sure to install filter with Flow Arrow pointing towards engine side of fuel line.



Fuel Filter
Figure 5-13

Draining The Fuel Tank

1. Park unit on a flat surface. Make sure blade engagement switch is **(OFF)**, both control levers are **(OUT)**, and park brake is **(ON)**. Stop engine and remove ignition key.
2. Disconnect negative battery cable from the battery.
3. Refer to Figure 5-3: Find fuel selector valve and turn to center position “O” to shut off fuel.



Fuel Shut-Off Valve
Figure 5-14

4. Trace fuel line from selector valve to fuel filter. Remove line from fuel filter and place detached end into an approved fuel container.
5. Turn selector valve to right tank and allow tank to drain. Watch level of fuel in the fuel container. DO NOT allow container to overflow, spilled fuel is extremely flammable.
6. Allow tank to drain. Tanks may not drain 100% due to fuel line location.
7. Repeat steps 5 & 6 with the left tank.
8. Reinstall fuel line to its original state and reattach to fuel filter. Location and options many vary by engine.

Belt Maintenance

DANGER

Before raising floor platform or removing pulley guards, make certain blade engagement switch has been shut off, deck has been properly blocked up, engine has been shut off, and switch key has been removed for maximum safety. Replace all guards and floor platform before putting mower back into service. Repairs or maintenance requiring engine power should be performed by trained personnel only.

Refer to Figure 5-15 and Figure 5-16 on page 65:

Replace belts that show signs of severe cuts, tears, excessive weather checking, and cracking or burns caused by slipping. Slight raveling of belt covering does not indicate belt damage. Trim ravelings with a sharp knife.

Inspect belt pulley grooves and flanges for wear. A new belt, or one in good condition, should never run against the bottom of the groove. Replace pulley when this is the case, otherwise belt will lose power and slip excessively.

Never pry a belt onto a pulley as this will cut or damage the fibers of the belt covering.

Keep oil and grease away from belts, and never use belt dressings. Any of these will destroy the belt composition in a very short time.

Deck Drive Belt Removal & Installation

Refer to Figure 5-15 on page 65:

1. Park mower on a flat surface.
2. Make sure blade engagement switch is **(OFF)**, control levers are fully **(OUT)**, park brake is **(ON)** and engine switch key is **(OFF)** and removed.
3. Place deck height in the lowest position.
4. Remove deck belt covers and raise floor platform.
5. Pull hitch pin (#8).
6. Release deck belt tension with by placing a socket wrench with a 3/4" socket on the over-center-release bolt (#9) and turning counterclockwise. This will relieve the tension on the tension idler spring (#11).
7. Pull tension idler (#6) away from the belt to provide maximum belt clearance.
8. Remove existing deck drive belt (#3).
9. Route new deck drive belt (#3) per the illustration shown in Figure 5-15.
10. Re-tension idler (#6) by turning bolt (#9) clockwise until over-center-release locks in place. Check belt tension per the **"Deck Drive Belt Adjustment"** on page 49.
11. Re-install hitch pin (#8).
12. Re-install deck belt covers and lower floor platform.

Ground Drive Belt Removal & Installation

Refer to Figure 5-16 on page 65:

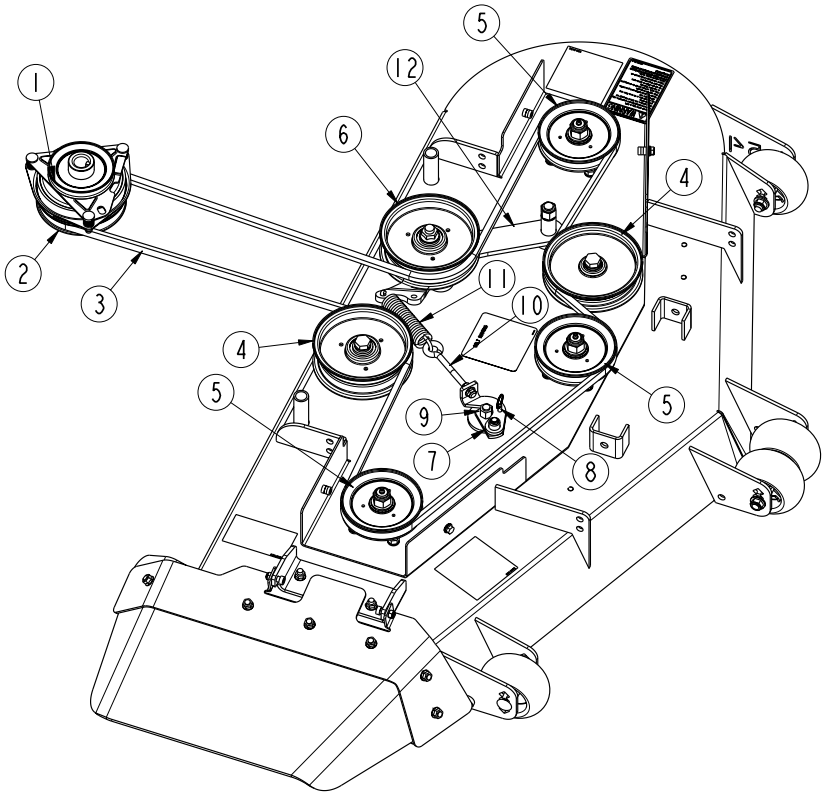
1. Park mower on a flat surface.
2. Make sure blade engagement switch is **(OFF)**, control levers are fully **(OUT)**, park brake is **(ON)**, and engine switch key is **(OFF)** and removed.

WARNING

Make sure engine and engine muffler is completely cooled before working on and around the drive belt. Severe burns to the body could result if engine and muffler have not cooled.

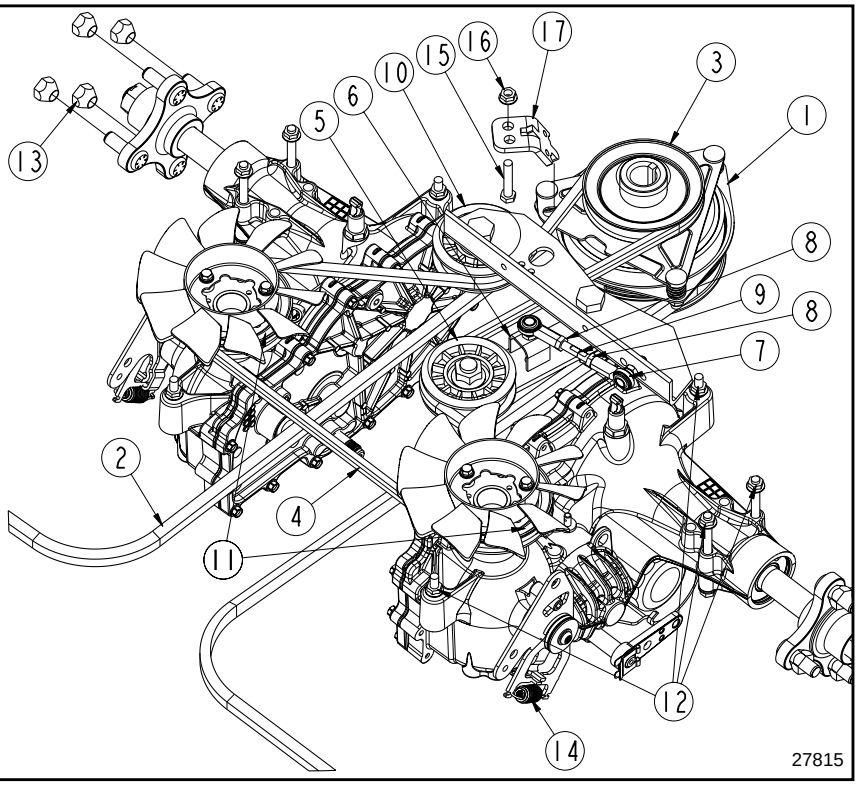
3. Place deck height in the lowest position.
4. Remove deck drive belt (#2) from deck drive pulley (#1) as outlined in **"Deck Drive Belt Removal & Installation"** instructions on this page. This belt does not need to be removed from any of the deck pulleys shown in Figure 5-15.
5. Back-up jam nuts (#8) 6 or more turns. One nut has right hand threads and the other nut has left hand threads.
6. Shorten take-up rod assembly (#7) by screwing take-up rod (#9) until drive belt (#4) can be removed from take-up pulley (#5).
7. Remove clutch locking bracket (#17) by removing front right engine mounting bolt (#15) and nut (#16).
8. Slide drive belt off of take-up pulley (#5), pump pulleys (#11), belt pulley (#10), and drive pulley (#3).
9. Slide new drive belt over drive pulley (#3), belt pulley (#10), pump pulleys (#11), and take-up pulley (#5).
10. Lengthen take-up rod assembly (#7) by screwing take-up rod (#9) until drive belt (#4) is secured on the pulleys.
11. Re-tension drive belt (#4) per **"Ground Drive Belt Adjustment"** instructions on page 49.
12. Re-install deck drive belt (#2) on the deck drive pulley (#1). Make sure the belt is routed properly on all deck pulleys.
13. Re-tension deck belt idler per the **"Deck Drive Belt Removal & Installation"** instructions on this page.
14. Re-install clutch locking bracket (#17) with engine mounting bolt (#15) and hex flange nut (#16). Make sure locking bracket is seated in the clutch locking notch and then tighten the mounting bolt to the correct torque.

1. Ground drive pulley
2. Deck drive pulley
3. Deck drive belt
4. Deck belt pulley
5. Deck blade spindle pulley
6. Tension idler
7. Over-center tensioner
8. Hitch Pin
9. Over-center release (Use 3/4" socket wrench)
10. Tension eye bolt
11. Tension idler spring
12. Idler arm



Deck Drive Belt Layout
Figure 5-15

1. Deck drive pulley
2. Deck drive belt
3. Ground drive pulley
4. Ground drive belt
5. Take-up pulley
6. Take-up pivot arm
7. Take-up rod assembly
8. Take-up rod jam nuts
9. Take-up rod
10. Belt pulley
11. Pump pulleys
12. Transaxle mounting bolts
13. Wheel lug nuts
14. Neutral return spring
15. Engine mounting bolt
16. Hex Flange Lock Nut
17. Clutch Locking Bracket



Ground Drive Belt Layout
Figure 5-16

Mower Blade Maintenance

Blade Inspection

Check mower blades daily, they are the key to power efficiency and well groomed turf. Keep them sharp, a dull blade will tear rather than cut grass, leaving a brown ragged top on the grass within a few hours. A dull blade also requires more power from the engine.

Replace any blade which is bent, cracked, or broken.

WARNING

DO NOT try to straighten a blade that is bent. Never weld a broken or cracked blade. ALWAYS replace with a new Land Pride blade to assure safety.

DANGER

Never work with blades while engine is running or with blades engaged. Always push blade engagement switch down **(OFF),** *move both control levers to neutral and then fully* **(OUT),** *set park brake* **(ON),** *and turn engine* **(OFF).** *Block up mower when you must work under it. Wear gloves when handling blades. Always check for blade damage if mower should strike a rock, branch, or other foreign object during mowing!*

Blade Removal

IMPORTANT: Blade mounting bolts have right hand threads. Turn blade bolts counterclockwise to loosen and clockwise to tighten.

Refer to Figure 5-2 on page 56:

1. Remove cutting blades (#14) with a 11/16" wrench by grasping end of blade with a rag or thick padded glove while loosening and removing 1/2" blade bolt (#12) and blade washer (#13).

Blade Sharpening

DANGER

Keep blades balanced when sharpening. An unbalanced blade may come loose and fly out from under the deck. Also, an unbalanced blade will shorten the spindle bearing's life.

CAUTION

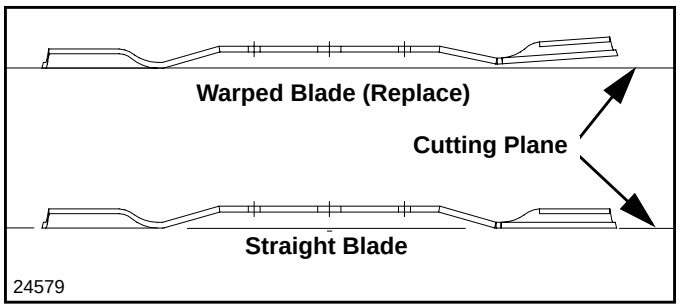
ALWAYS wear eye protection and gloves when sharpening a blade.

NOTE: Care should be taken in order not to remove any more material than necessary to sharpen blade.

1. Clean blade, blade washer and mounting surface of all debris before inspecting blade and sharpening.

Refer to Figure 5-17:

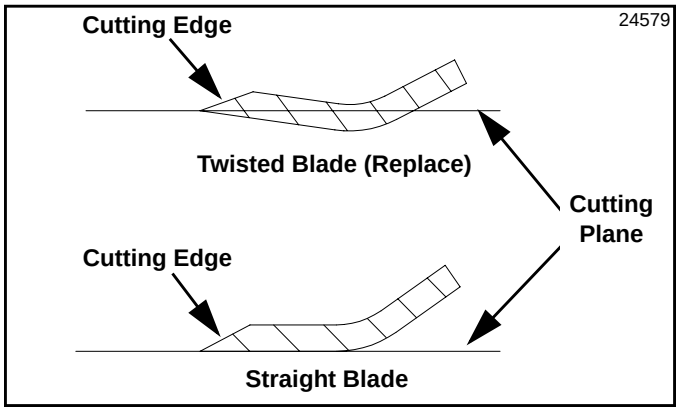
2. Lay blade on a flat surface and check blade to make sure it is not warped. Replace any blade that is warped.



Comparison of Warped & Straight Blades
Figure 5-17

Refer to Figure 5-18:

3. Lay blade on a flat surface and check both ends of blade to make sure it is not twisted. Replace any blade that is twisted.

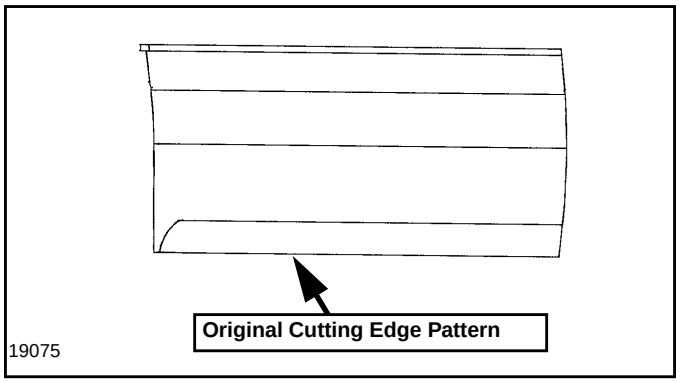


Comparison End View of Twisted & Straight Blades
Figure 5-18

4. Check blade cutting edge. Replace blade if nicks are severe. Blade may be sharpened if cutting edge is dull or slightly nicked.

Refer to Figure 5-19:

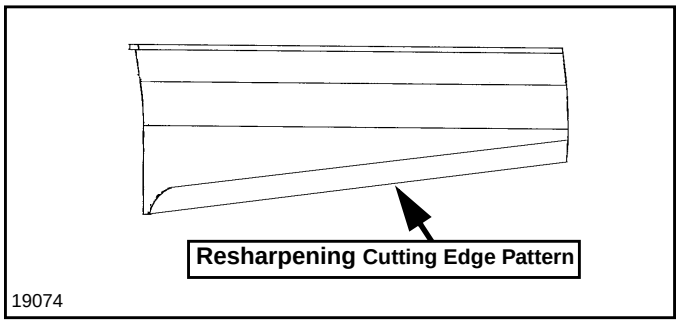
NOTE: New mower blades are furnished with cutting edge parallel with back of blade. Do not sharpen blade to original parallel pattern. It is easier to get a straight cutting edge by resharpening the pattern to the one shown in Figure 5-20.



Blade Resharpening
Figure 5-19

Refer to Figure 5-20:

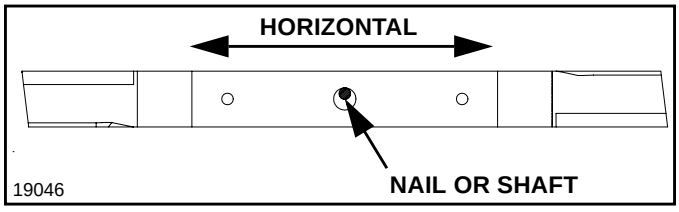
5. Sharpen blade by following the grinding pattern shown in Figure 5-20.
   a. Grind cutting edge at the same bevel as the original angle. (27 1/2 degrees).
   b. Sharpen only the top of the cutting edge to maintain sharpness.
   c. Touch-up sharpening can be done with a file.



Blade Resharpening
Figure 5-20

Refer to Figure 5-21:

6. Remove an equal amount of material from each end of the blade to keep blade in balance. Check blade balance as follows:
   a. Positioning center of blade horizontally on a nail or shaft. See Figure 5-21.
   b. If either end of the blade rotates downward, grind (remove) metal on that end until blade will balance horizontally on the nail or shaft.
   c. Resharpening blades can be installed after they have been properly sharpened and balanced.



Blade Balancing
Figure 5-21

Blade Installation

WARNING

When mounting blades, rotate them after installation to ensure blade tips do not touch each other or sides of the mower.

WARNING

Failure to torque blade bolt properly may result in the blade coming loose and falling off causing a serious injury.

IMPORTANT: Replace mower blades with Land Pride blades only.

IMPORTANT: Always install blades with cutting edge facing direction of blade spindle rotation and with wing tips pointing up towards bottom of deck.

IMPORTANT: Do not re-use spindle bolts which have stripped, worn or undercut threads. For proper spindle bolt torque value. see **"Additional Torque Values"** on page 79.

Refer to Figure 5-2 on page 56:

1. Reinstall sharpened or new cutting blades (#14), blade washer (#13), and blade bolt (#12). Care should be taken when installing blade bolt to not get it cross threaded.
2. Tighten blade bolt to the correct torque. See **"Additional Torque Values"** on page 79 for correct torque values.

General Engine Maintenance

Detailed instructions and recommendations for break-in and general maintenance are specified in the Engine Operator's Manual. Please refer to this manual for engine servicing, lubricating oil levels with capacity and viscosity recommendations, bolt torques, etc. **The engine warranty is backed by the engine manufacturer.** Special attention should be paid to applicable data which is not duplicated here.

Engine Oil and Oil Filter

Refer to Figure 5-24 on page 69:

See **"Engine Specifications"** on page 76 and Engine Operator's Manual for maintenance schedule. oil type, and capacity. Check oil daily and after every 4 hours of operation. Mower must be sitting level when checking oil. Change engine oil and oil filter after the first 5 hours of operation and per engine manufacturer's recommendations thereafter. Change oil more frequently if mower is operated in extremely dirty conditions.

IMPORTANT: Make certain engine is level and you are inserting the dipstick correctly when checking oil. Incorrect oil levels can cause engine problems.

Check Engine Oil

Refer to Figure 5-22:

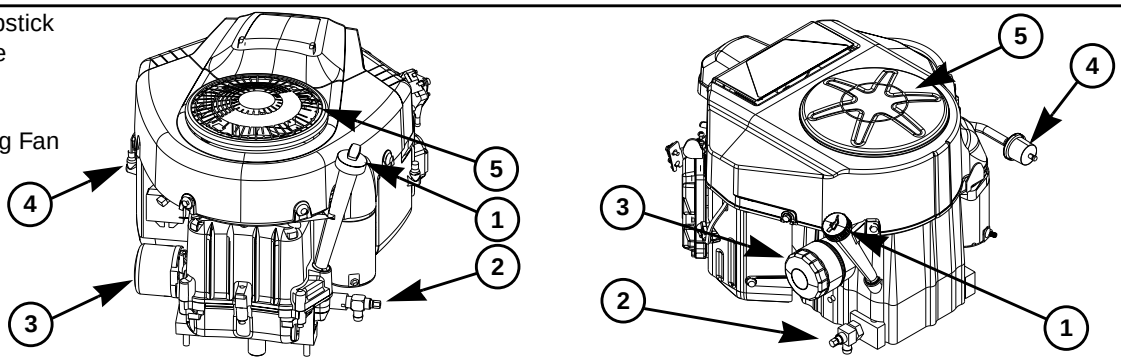
1. Park on a level surface, shut engine off, and allow time for oil to cool and drain into the sump.
2. Clean area around oil fill cap/dipstick (#1) of dirt and debris before removing it. Unscrew oil fill cap and wipe dipstick clean.
3. Check oil level on dipstick as follows:
   - **Briggs & Stratton Engines:** Insert dipstick fully **by screwing it in** and removing it again to check oil level.
   - **Kawasaki Engines:** Insert dipstick fully **without screwing it** in and removing again to check oil level.
4. If oil level on the dipstick is near or below the lower limit mark, then add recommended oil until it reaches the full mark. **Do not overfill**.
5. Reinstall oil filler cap/dipstick by screwing it in firmly.

Change Engine Oil

Refer to Figure 5-22:

1. Park unit on a flat surface. Make sure blade engagement switch is **(OFF)**, both control levers are **(OUT)** and park brake is **(ON)**. Stop engine and remove ignition key.
2. Place a suitable container on the ground beneath drain valve (#2).
3. Unscrew oil drain valve (#2) until oil flows freely and valve head offers some resistance. Do not unscrew valve any farther.
4. Remove oil filter with a filter wrench and let remaining oil drain out. Discarding oil filter in a manner that is compatible with the environment.
5. Clean engine oil filter base. Coat new filter O-ring with clean engine oil and install filter to engine oil filter base.
6. Hand tighten oil filter until O-ring seats. Finish tightening by turning filter to the specifications provided in the Engine Operator's Manual.
7. Retighten drain valve (#2).
8. Dispose of used motor oil in a manner that is compatible with the environment. Do not throw used oil in the trash, pour it on the ground, or down a drain.
9. Fill engine with correct oil and quantity provided in Engine Operator's Manual and specifications on page 76 of this manual. Do not overfill with oil. Continue on next page.
10. Replace oil fill cap/dipstick, start engine, and check oil filter for leaks.
11. Stop engine and check oil level. See **"Check Engine Oil"** on this page.

1. Oil Fill Cap/dipstick
2. Oil Drain Valve
3. Oil Filter
4. Fuel Filter
5. Engine Cooling Fan



Zero Turn Mower Engines
Figure 5-22

Engine Air Filter

A specially designed dry filter is standard equipment and supplies clean combustion air to the engine.

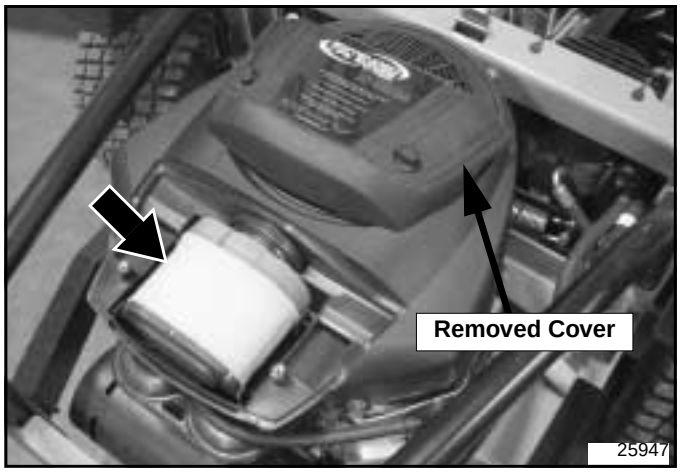
NOTE: Do not operate engine with a damaged air filter or without air filter elements. Dirt will enter engine causing dust induced engine damage.

IMPORTANT: Do not block air intake such as setting an object in front of the air intake opening.

Internal Type Air Filters

Refer to Figure 5-23:

18.5 HP and 23 HP Kawasaki engines and 22 HP and 26 HP Briggs & Stratton engines are supplied with internal air filters. Perform engine air filter maintenance per the Engine Operator's Manual and **"Maintenance Schedule"** on page 55.



Briggs & Stratton Internal Air Filter Shown
Figure 5-23

Canister Type Air Filters

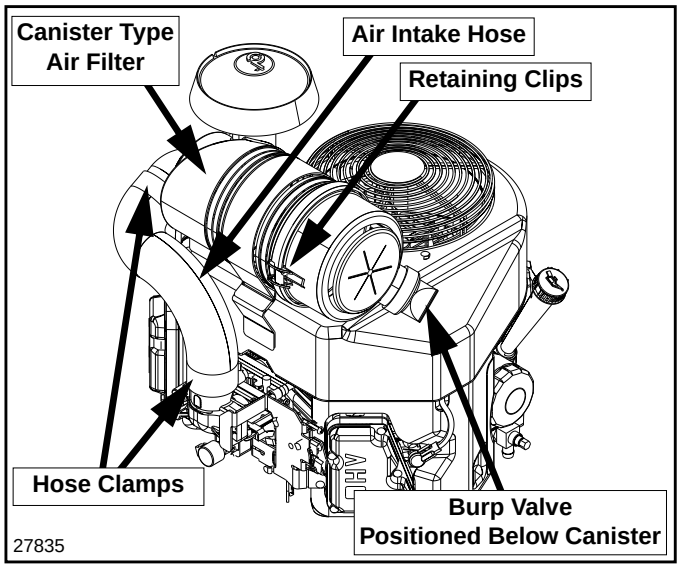
Refer to Figure 5-24 & Figure 5-25:

The 23.5 HP Kawasaki engine is equipped with a canister air filter mounted above the engine. Perform engine air filter maintenance per the Engine Operator's Manual and **"Maintenance Schedule"** on page 55.

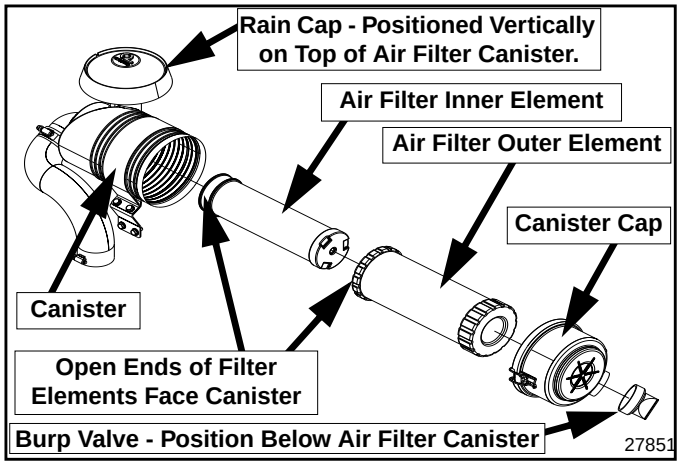
1. Replace filter element every 200 hours or every year, (whichever comes first). ***Service more frequently when used in dusty conditions***.
2. Release retaining clips and remove filter element. Clean canister with a damp cloth.
3. Before installing a new filter element, inspect it by placing a bright light inside and rotate the element slowly, looking for any holes or tears in the paper. Also check gaskets for cuts or tears. Do not attempt to use a damaged element which will allow abrasive particles to enter the engine.
4. Inspect burp valve. Replace burp valve if it is cracked, torn, stays open, or is missing. See also **"Burp Valve Information"** on page 70.
5. Install new inner element into the new outer element as shown in Figure 5-25.
6. Install new outer filter element by inserting the open end in the canister first.

IMPORTANT: Burp valve must be positioned below the canister to make certain it drains water away from the filter elements properly.

7. Reinstall canister cap with burp valve positioned below the canister. Make sure it seals all around the canister before latching retaining clips.
8. Check all fittings and clamps periodically for tightness. Inspect hoses for holes or cracks.
9. Periodically check engine intake hose for signs of ingested dust. Repair source of ingested dirt.
10. Never operate a machine without an air filter installed.



26 HP Kawasaki Engine With Canister Type Air filter
Figure 5-24


Rain Cap - Positioned Vertically on Top of Air Filter Canister.
Air Filter Inner Element
Air Filter Outer Element
Canister Cap
Canister
Open Ends of Filter Elements Face Canister
Burp Valve - Position Below Air Filter Canister
27851

Canister Air Filter For 26Hp Kawasaki Engine
Figure 5-25

Burp Valve Information

Refer to Figure 5-26:

The burp valve is a highly important part of your dust filter. It opens and shuts expelling collected dust and water as the engine's vacuum pressure pulsates. It also dumps dust collected in the filter canister when the engine stops running. If the burp valve is damaged, dust that would normally be discharged from the canister can collect on the filter element causing its life to be shortened. Replace the burp valve if it is open, cracked, torn, or missing.

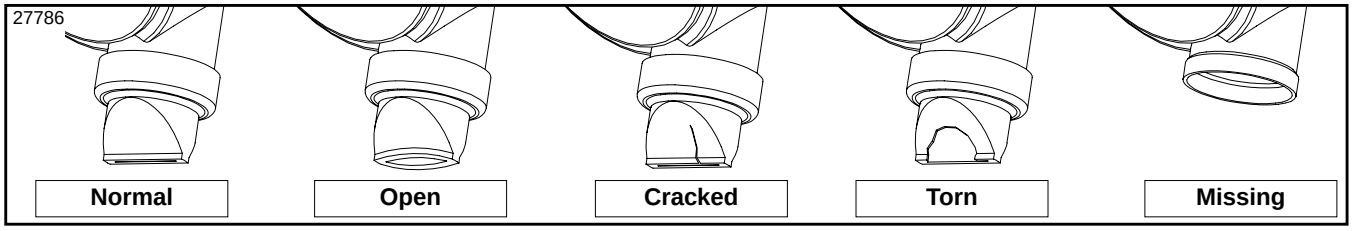


Figure 5-26

Air Filter Handling

Refer to Figure 5-25:

Prevent costly and non-warrantable premature engine damage by maintaining the air filter properly. Many engine problems are due to improper handling of the air filter. Dust and dirt that gets past the air filter will damage engine cylinder, piston, and bearings in a few hours. Avoiding the following common mishandling:

- Over servicing
- Improper installation
- Damaged air filtering system
- Incorrect air filter element

Over Servicing

Over servicing occurs when an air filter element is inspected and/or replaced too often. Dust and dirt can fall off the filter element onto the canister where it can be drawn into the intake system. Only a few grams of dirt getting into an engine during each filter inspection can prematurely produce dust induced engine damage. A partially dirty air filter element is not harmful to the engine.

The air filter element should be changed before it becomes too dirty and restricts air flow to the engine hindering its performance. Replace the air filter element immediately should this happen. Engines that do not get proper amounts of air will draw in excessive amounts of gas causing premature engine damage.

The frequency of the air filter needing changing is largely determined by operating conditions. Dusty conditions will require more frequent servicing.

A dirty filter element should always be replaced with a new element. Improper cleaning procedures can get dust on the inside of the filter causing dirt induced and engine damage. **The air filter warranty expires upon cleaning or servicing a used filter in any manner. Land Pride does not warranty a dust induced engine damage if a used air filter element has been cleaned or serviced in any manner.**

Improper Installation

Improper installation occurs when dust leaks past the seals. The filter element must be aligned within the canister and properly seated on both ends to prevent dirt from entering the engine.

Damaged Air Filtering System

A damaged air filtering system occurs from mishandling of the filter element and operating the mower in areas that could damage the canister.

Banging and/or bumping the filter element against a solid object such as a tire or blowing the element with air can damage the seals and/or force dust and dirt particles through the filter media creating a hole for dirt to pass through to the engine.

Driving the mower carelessly over rough terrain, jutting sticks, heavy brush, and severe rocks can damage the air cleaner canister. Periodically inspect the outside of the air cleaner canister for external damage and replace if necessary.

Incorrect Air Filter Element

The air filter must remain intact to block passage of dirt and foreign particles. It must be of sufficient size and construction to withstand stresses, caused by rapid cycling of air volume demanded by the engine, without cracking or tearing under fatigue and pressure. Its filter elements must have the correct media composition, filter area, micron size, and dimensions to properly filter the air of dirt while at the same time passing sufficient air to the engine.

Land Pride and the engine manufacturers have carefully selected a reliable filter designed to fit these needs. Always use genuine Land Pride filters. **Failure to use original equipment replacement parts is an alteration and will not be considered for warranty in the event of a dust induced engine damage.** See **"Engine Specifications"** on page 76 for Land Pride air filter replacement numbers.

End of Season & Long Term Storage

Take the following steps when storing the mower at the end of the season and when the unit will not be used for long periods to ensure readiness for the next mowing season.

IMPORTANT: Do not use a high pressure washer on or around hydraulic pumps and motors. Water intrusion will void pump and motor warranties.

1. Remove all grass, dirt, trash, and grease that may have accumulated on the mower and moving parts.
2. Scrape off compacted dirt, trash, and grass clippings from the deck underside. A coating of oil may also be applied to the deck underside to minimize oxidation.
3. Clean and touch up all scrapes with Land Pride spray paint.
4. Check blades and blade bolts for wear and replace if necessary.
5. Check thoroughly for any worn or damaged parts that need replacing and order them from your nearest Land Pride Dealer.
6. Thoroughly lubricate machine, according to lubrication instructions.
7. Prepare engine for storage:
   a. Run engine for a minimum of 15 minutes.
   b. Drain oil from crankcase while engine is still warm.
   c. Refill with fresh oil of proper viscosity. Refer to **“General Engine Maintenance”** on page 68 and **“Engine Specifications”** on page 76.
   d. Drain fuel tank and run engine until it stops from lack of fuel. Gasoline evaporates if left in carburetor for long periods, forming gum and varnish deposits in the carburetor. These deposits will cause engine flooding and loss of power.
   e. Service air cleaner. See **“Engine Air Filter”** on page 69.
   f. Remove and replace fuel filter if not done in the previous 100 hours.
   g. Remove spark plugs and pour a tablespoon of engine oil into each spark plug hole. Install plugs, but do not reconnect plug leads.
   h. Crank engine with starter at least a dozen revolutions to distribute oil over cylinder walls and valve mechanism.
   i. Clean dirt and chaff from cylinder fins, blower housing, and muffler.
   j. Clean exterior surface of engine. Spread a light film of oil over any exposed metal surfaces of engine that are subject to corrosion.
   k. Check oil fill cap and fuel tank caps to make certain they are securely in place.
8. Store mower in a clean, dry place.
9. Block mower up so weight is off the tires.

NOTE: Do not deflate tires.

10. Protect battery from freezing temperatures. Disconnect the negative ground wire from battery to reduce chances of a slow electrical drain. Occasionally recharging battery during storage will extend battery life.

New Season Preparation

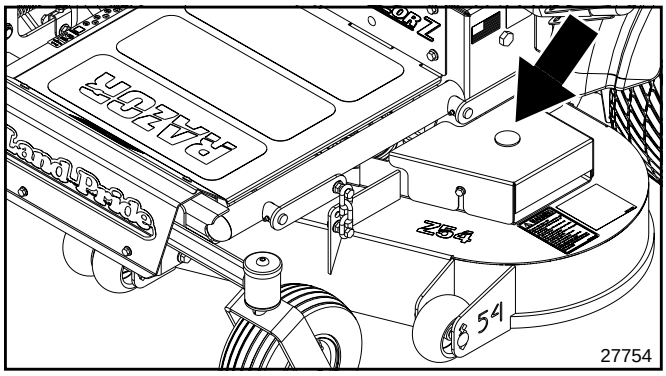
The following service is required before starting the mower after storing it for a season:

IMPORTANT: Do not use a high pressure washer on or around hydraulic pumps and motors. Water intrusion will void pump and motor warranties.

1. Clean mower, removing trash and dirt accumulation.
2. Check engine oil level.
3. Tighten any bolts that have loosened and make sure all hair pins, cotter pins, and clevis pins are in place.
4. Install all safety shields and review safety precautions listed in this manual.
5. Check and inflate tires to correct psi provided in **“Tire Inflation Chart”** on page 79.
6. Fill fuel tank with fresh gasoline.
7. Reconnect spark plug leads to spark plug.
8. Run machine at half speed for 5 minutes, checking operation of the control levers. Stop engine and check for oil leaks, loose fittings, and so forth.

Lubrication Points

Lubrication Legend	Multi-purpose spray lube	Multi-purpose grease lube	Multi-purpose oil lube	50 hrs	Intervals in hours at which lubrication is required



25 Hours

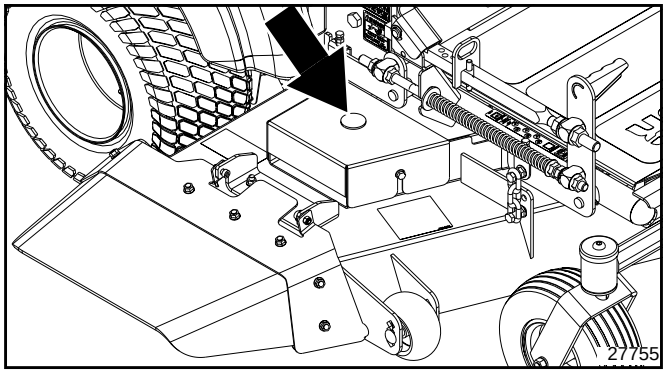
Left Blade Spindle

Access through rubber slit in pulley cover.

1 - Zerk

Type of Lubrication: Multi-purpose Grease

Quantity = As required



25 Hours

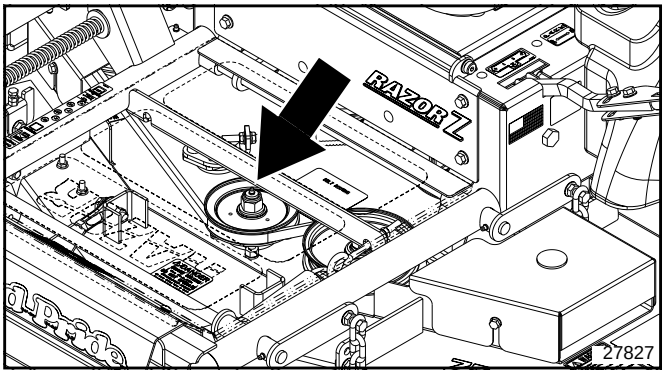
Right Blade Spindle

Access through rubber slit in pulley cover.

1 - Zerk

Type of Lubrication: Multi-purpose Grease

Quantity = As required



25 Hours

Center Blade Spindle

Lower Deck fully down to access under the floor platform

1 - Zerk

Type of Lubrication: Multi-purpose Grease

Quantity = As required

100 Hours

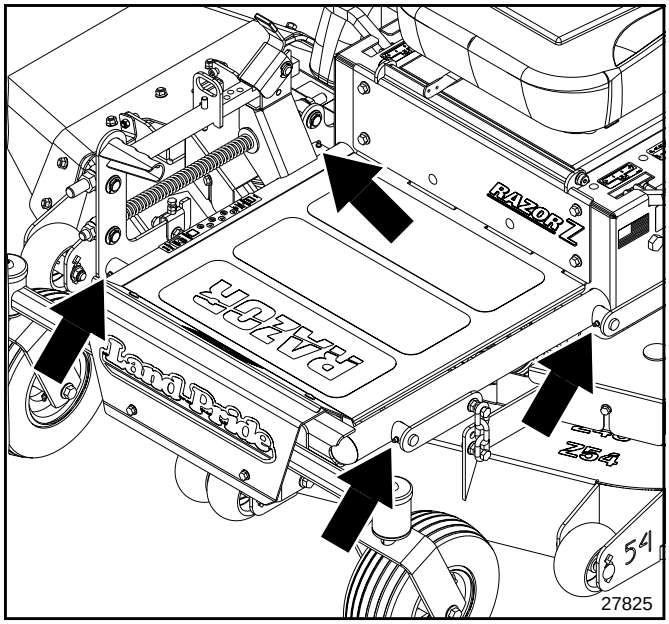
Caster Wheel Bearing

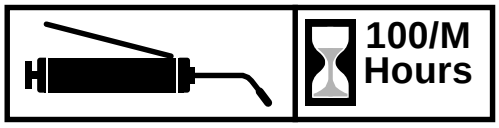
Located on hub of caster wheel

2 - Zerks (One on each caster wheel)

Type of Lubrication: Multi-purpose Grease

Quantity = As required





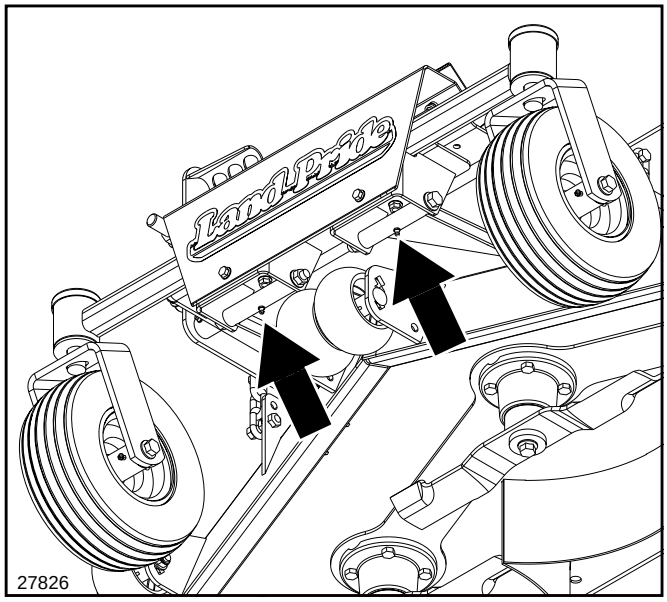
Deck Lift Points

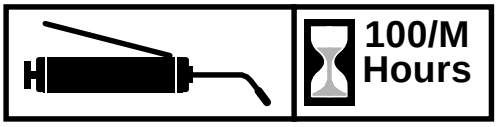
Locate on both sides of the floor platform

4 - Zerks (2 per side)

Type of Lubrication: Multi-purpose Grease

Quantity = As required every 100 hours or monthly, whichever comes first.





Deck Lift Pivot

Located in front of deck pivot mount

2 - Zerks

Type of Lubrication: Multi-purpose Grease

Quantity = As required
Every 100 hrs. or monthly, whichever comes first.

Symptoms	Probable Causes	Suggested Remedies
Starting motor does not crank	Control levers are not in neutral position and fully out	Place control lever in neutral and fully out.
	Park brake not engaged (ON)	Engage park brake
	Control lever interlock switch is not adjusted correctly	Have your dealer re-adjust the interlock switch.
	Blade Engagement switch is engaged	Disengage blade switch
	Weak or dead battery	Recharge or replace
	Loose or broken switches and/or damaged electrical wiring.	Repair or replace switches and electrical wiring
	Other causes	See Engine Operator's Manual
Engine cranks but does not start	No fuel in the fuel tanks	Fill tank
	Fuel filter and/or fuel line plugged	Replace fuel filter and/or fuel line
	Fuel tank valve turned to "OFF"	Select a fuel tank with gasoline See Figure 5-14 on page 63.
	Fuel tank valve turned to an empty tank	Switch fuel valve to the other tank See Figure 5-14 on page 63.
	Other causes	See Engine Operator's Manual
Engine: Runs with continuous misfiring or engine runs unevenly or erratically	Other causes	See Engine Operator's Manual
Grass cutting is ragged or uneven	Dull, bent, or broken cutting blades	Sharpen or replace cutting blades
	Deck full of wet sticky grass	Clean underside of deck
	Cutting Blades are not operating at full engine speed	Increase engine rpms to full speed (3600 rpm) Check engine speed with Land Pride Inductive Tachometer, Part No. 890-909C
	Belt over center take-up is loose	Tension over center take-up
	Worn or broken belt	Replace worn and broken belt See "Belt Maintenance" on page 64
	Deck is not level	Check air pressure in all 4 tires Make level adjustments to the deck See "Deck Cutting Height And Leveling" on page 50
Loss of power or system will not operate in either direction	Bypass valve is open	Close bypass valve
	Linkage bolt is loose or lost	Replace linkage bolt
	Bad ground drive belt and/or pump idler pulley	Replace belt and/or idler pulley Tighten idler pulley if loose
	Loose, lost, or broken belt take-up rod	Reattach or replace belt take-up rod
	Restrictions in air cleaner	Service air cleaner
	Internal interference or leakage in Hydro-Drive	See your dealer
	Insufficient hydraulic oil supply	Check hydraulic oil level in expansion tank and add oil if needed
	Poor compression	See your dealer
	Steering linkage needs adjustment	Adjust linkage See "Seat Adjustment" on page 48
	Air in system	Check filter & fittings
	Other causes	See Engine Operator's Manual

Symptoms	Probable Causes	Suggested Remedies
Overheating	Air intake screen or cleaning fins clogged	Clean screen and fins
	Not operating engine at rated speed	Increase engine speed to 3600 rpm
	Other causes	See Engine Operator's Manual
Low oil pressure (Indicated by oil light on while engine is running.)	Low oil level	Add oil
	Oil diluted or too light	Change oil and check for source of contamination
High oil consumption	Other causes	See your dealer
Mower jerky when starting or operates in one direction only	Steering control linkage needs adjustment	Adjust linkage See "Steering Adjustments" on page 47
	Hydro-drive faulty	See your dealer
Hydraulic system operates hot	Hydro-drive faulty	See your dealer
	Not operating engine at rated speed	Increase engine speed to 3600 rpm
Steering levers do not return to neutral	Steering linkage rods are out of adjustment	Adjust linkage See "Steering Adjustments" on page 47
	Steering linkage rods are bent, broken, or missing.	Replace steering linkage rods See item 14 on page 65
	Transaxle neutral return spring is broken or missing	Replace transaxle neutral return spring
Mower creeps when steering control levers are in neutral	Transaxle neutral return spring is broken or missing	Replace transaxle neutral return spring
Mower circles or veers in one direction	Steering linkage needs adjustment	Adjust linkage See "Steering Adjustments" on page 47
	Hydro-drive faulty	See your dealer

Engine Specifications

Engine Manufacture	Kawasaki		Briggs & Stratton
Mower Model No Z Models ZSR Models	ZSR54, ZSR60	ZSR54, ZSR60	ZSR54, ZSR60
Horsepower	23	23.5	26
Engine Model Type	FS691V	FX730V	44P777
Max Torque @ 2400 rpms	40.9 ft. lbs (55.4 N.m)	42.1 ft. lbs. (57.1 N.m)	N/A
Charging System	12-volt, 15 amps		12-volt, 16 amps
Starter	12-volt Electric Starter		
Ignition	Keyed 12 volt electronic system		
Governor	Mechanical		
Fuel Type	Unleaded gasoline with octane rating of 87 or higher		
Oil Cooling	without		
Engine Cooling	Forced air cooled, Fly-wheel fan		
Engine Type	4-stroke OHV, V-twin cylinder, gasoline		
Number of Cylinders	2		
Displacement	44.3 cu. in. (726cc)	44.3 cu. in. (726cc)	44.2 cu. in. (725cc)
Compression Ratio	8.2:1	8.2:1	N/A
Spark Plug No.	BPR4ES (NGK)		
Oil Capacity with Filter Change	2 US quarts (1.9L)		
Oil Type	SAE 10W-30		
Oil Filter Part No.	831-073C		831-053C
Fuel Filter Part No.	831-031C		831-035C
Air Filter Part No	831-074C	Outer 831-075C Inner 831-076C	831-054C

Hydrostatic Transaxle Specifications

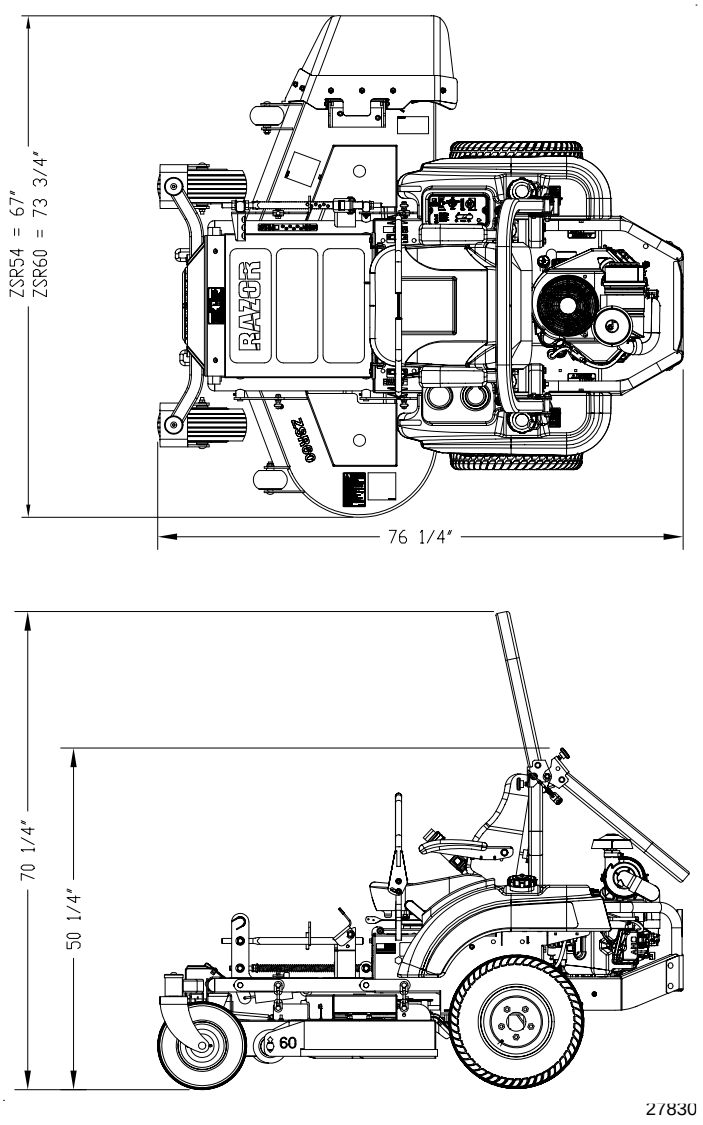
Mower Model No	ZSR54 & ZSR60
Transaxle Model Nos.	ZT-3100™
Gear Type	Cut Steel Gears
Number of Wheel Lugs	5
Traction Drive Type	Dual Hydrostatic Transmission
Hydraulic Motor/Pumps	Two variable displacement, axial piston type.
Hydraulic Motor/Pump Drive	V-belt drive from engine crankshaft
Hydraulic Oil Type	SAE 20W-50 engine oil
Hydraulic Oil Capacity - Per Side	Total = 78 to 80 fl. oz.to fill transaxle and expansion tank to cold fill line (75.7 fl. oz. to fill transaxle to top port plug + 4.3 fl.oz. to cold fill line in expansion tank)
Hydraulic Oil Filter No.	831-060C

General Specifications

Mower Model No	ZSR54	ZSR60
Weight with deluxe seat	890 lbs	915 lbs.
Width of Cut	54"	60"
Cutting Height	1 1/2" to 4 1/2" In 1/4" increments	
Trim Capacity (left side)	3"	6"

General Specifications

Mower Model No	ZSR54	ZSR60
Overall width Chute down	67 1/4"	73 3/4"
Overall Length	78 1/4" with hitch plate	
Tire-to-tire width:	48"	
Overall Height Top of folded ROPS **Top of unfolded ROPS**	50 1/4" 70 1/4"	
Certified ROPS	Standard	
Drive Tires	5-bolt, 20 x 10 -10 Turf Tread	
Front Tires	13 x 5 - 6, Ribbed tread with roller bearings	
Hour Meter	Standard equipment	
Fuel Capacities	12 US GAL	
Steering Type	Hydrostatic Twin lever steering provides independent control of each drive wheel.	
Twin Lever Steering Controls	Speed, forward, reverse, brake, and turns.	
Steering Turning Radius	True zero degree. Turns with counter-rotating independent drive wheels.	
Brake Service	Hydrostatic dynamic braking.	
Park Brake Type	Manual activated over-center lever to pawl over cog wheel.	
Ground Speed	Forward: 0-7.2 MPH Reverse: 0-4.5 MPH	
Motor Drive	Single V-belt with electric clutch and manual take-up idler pulley.	
Wheel Drive	High torque piston type planetary reduction motors	
Electrical Operated Logic-Control Safety Features	Electric logic-control system governs blade engagement, forward & reverse motion, engine starting & running, and parking brake functions.	
Evaporative Emission Control System on EPA Compliant Mowers	This equipment uses a sealed fuel system which incorporates a non-vented fuel cap. Evaporative emissions are vented to the engine where they are combustor during normal engine operation.	
Seat Options	Deluxe cushion seat with arm rests.	
Mainframe Construction	Welded steel	
Front Caster Wheels	Free turning with greasable roller bearings.	
Front Caster Fork Construction	5/16" steel.	
Deck Thickness	10 Gauge decks with 11 gauge doubler plate and 3/16" reinforcement plate connecting spindle housing mounts	
Box-Section Reinforced Front Edge	10 ga. thick	
Deck Trim Edges	Solid 1" x 3/8" steel bar for reinforced trim edge & doubled plated 10 Gauge front edge.	
Deck Housing Depth	5 3/16" deep, (room for high-capacity mowing)	
Deck Lift	Foot-operated deck height adjustment with locking pin for setting height.	
Hand Operated Controls	Ignition switch, throttle lever, control levers, park brake, blade engagement switch, choke knob, and Fuel Tank Selector Valve.	
Indicators	Engine warning light and hour meter for engine run time.	
Cup Holder	Two cup holders molded into the left side fuel tank. Accommodates nearly any cup size.	
Cutting Height Adjustments	Height adjustment in 1/4" increments from 1" to 5".	
Mowing Blades	3 Heavy-duty, heat-treated, high-lift steel blades	
	.25" x 2 1/2" x 18.8"	.25" x 2 1/2" x 20.9"
Blade Tip Speed	18,515 FPM	18,700 FPM
Blade Drive	Single B-Section belt drive to all three spindles. Spring loaded take-up idler pulley.	
Blade Spindles	Machined ductile iron housing, 1 3/8" diameter high carbon steel shafts and greasable ball bearings.	
Deck Suspension	Four point suspension from frame by mechanical linkage with counter balance springs.	
Anti-Scalp Rollers	4 Anti-scalp rollers to improve flotation in rolling and uneven terrain.	



ZSR54 & ZSR60 Zero Turn Mowers

Torque Values Chart

Bolt Size (Inches)	Bolt Head Identification: Grade 2		Grade 5		Grade 8	
in-tpi [1]	N m [2]	ft-lb [3]	N·m	ft-lb	N·m	ft-lb
1/4" - 20	7.4	5.6	11	8	16	12
1/4" - 28	8.5	6	13	10	18	14
5/16" - 18	15	11	24	17	33	25
5/16" - 24	17	13	26	19	37	27
3/8" - 16	27	20	42	31	59	44
3/8" - 24	31	22	47	35	67	49
7/16" - 14	43	32	67	49	95	70
7/16" - 20	49	36	75	55	105	78
1/2" - 13	66	49	105	76	145	105
1/2" - 20	75	55	115	85	165	120
9/16" - 12	95	70	150	110	210	155
9/16" - 18	105	79	165	120	235	170
5/8" - 11	130	97	205	150	285	210
5/8" - 18	150	110	230	170	325	240
3/4" - 10	235	170	360	265	510	375
3/4" - 16	260	190	405	295	570	420
7/8" - 9	225	165	585	430	820	605
7/8" - 14	250	185	640	475	905	670
1" - 8	340	250	875	645	1230	910
1" - 12	370	275	955	705	1350	995
1-1/8" - 7	480	355	1080	795	1750	1290
1 1/8" - 12	540	395	1210	890	1960	1440
1 1/4" - 7	680	500	1520	1120	2460	1820
1 1/4" - 12	750	555	1680	1240	2730	2010
1 3/8" - 6	890	655	1990	1470	3230	2380
1 3/8" - 12	1010	745	2270	1670	3680	2710
1 1/2" - 6	1180	870	2640	1950	4290	3160
1 1/2" - 12	1330	980	2970	2190	4820	3560

Bolt Size (Metric)	Bolt Head Identification: 5.8 Class 5.8		8.8 Class 8.8		10.9 Class 10.9	
mm x pitch [4]	N·m	ft-lb	N·m	ft-lb	N·m	ft-lb
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	l215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

[1] in-tpi = nominal thread diameter in inches-threads per inch

[2] N·m = newton-meters

[3] ft-lb= foot pounds

[4] mm x pitch = nominal thread diameter in millimeters x thread pitch

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

Additional Torque Values

Drive Wheel Lug Nuts (1/2"-20 UNF)	75 ft-lbs.	102 N-m
Blade Spindle bolts (1/2"-20 UNF x 2 1/2" GR8)	60 to 70 ftlbs.	82 to 95 N-m
Spindle Housing Flange Bolts	55 ft-lbs	75 N-m
Idler Pulley Bolts (5/8"-11 UNC GR5)	130 ft-lbs.	176 N-m
Electric Clutch Bolt (7/16"- 20 UNF GR8)	50 to 55 ft-lbs.	68 to 75 N-m
Hydro-Gear Top Port Plug (See Figure 5-11 on page 61, Item 4.)	15 ft-lbs.	20 N-m
Chock & Throttle Cable Clamp Screws	35 in-lbs.	3.9 N-m

Tire Inflation Chart

Tire	Inflation PSI
Drive Wheels	8 to 12
Caster Wheels	8 to 12

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